FSP 150SP-100

Fiber Service Platform 150SP-100

Installation and Operations User Manual

Product Release 6.1.1

Document Issue: A (February 2014)

ADVA™ Optical Networking

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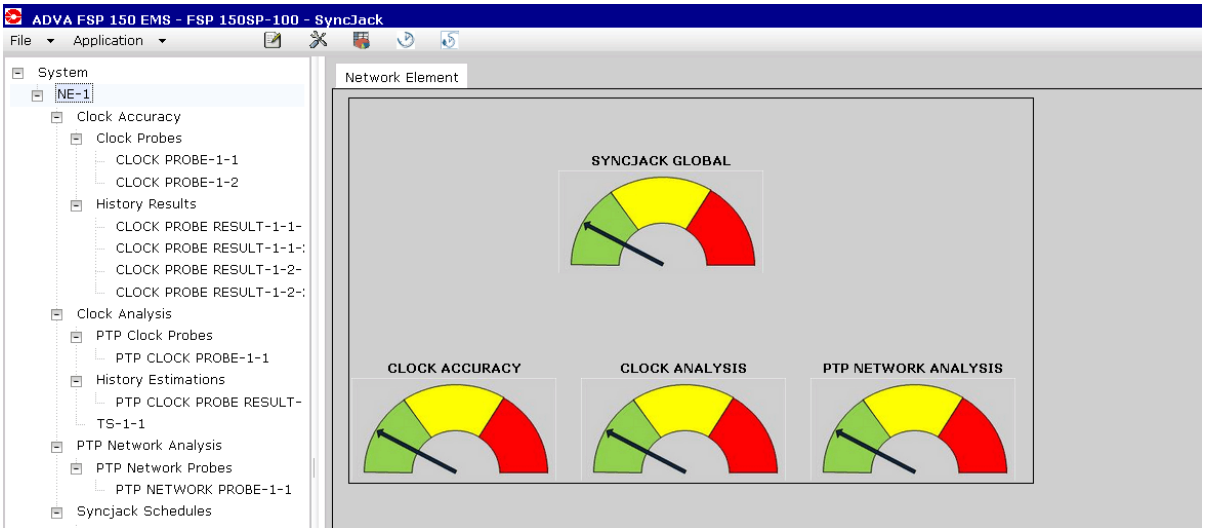
Chapter 1

SP-100 Overview

The ADVA Optical Networking FSP 150 family of Ethernet access products provides devices for Ethernet demarcation, extension and aggregation to support delivery of intelligent Ethernet services both in-region and out-of-region.

The evolving state of synchronization services raises issues of maintenance, operation and performance assurance. For this purpose ADVA Optical Networking has introduced a new concept called Syncjack™. Syncjack is a comprehensive technology for timing distribution, monitoring and timing service assurance. A Dashboard indicator displays analysis results (see Figure 1 on p. 23). The Global status reflects a composite of 3 status meters: Clock Accuracy, Clock Analysis and Precision Time Protocol (PTP) Network Analysis. For the indicator bar, a horizontal line indicates N/A, green indicates normal operation, yellow indicates some issue exists, red indicates a significant problem.

Figure 1: SyncJack Dashboard Indicators



The Syncjack GUI concept provides several layers of indicators allowing for step by step monitoring and troubleshooting (see the following figure).

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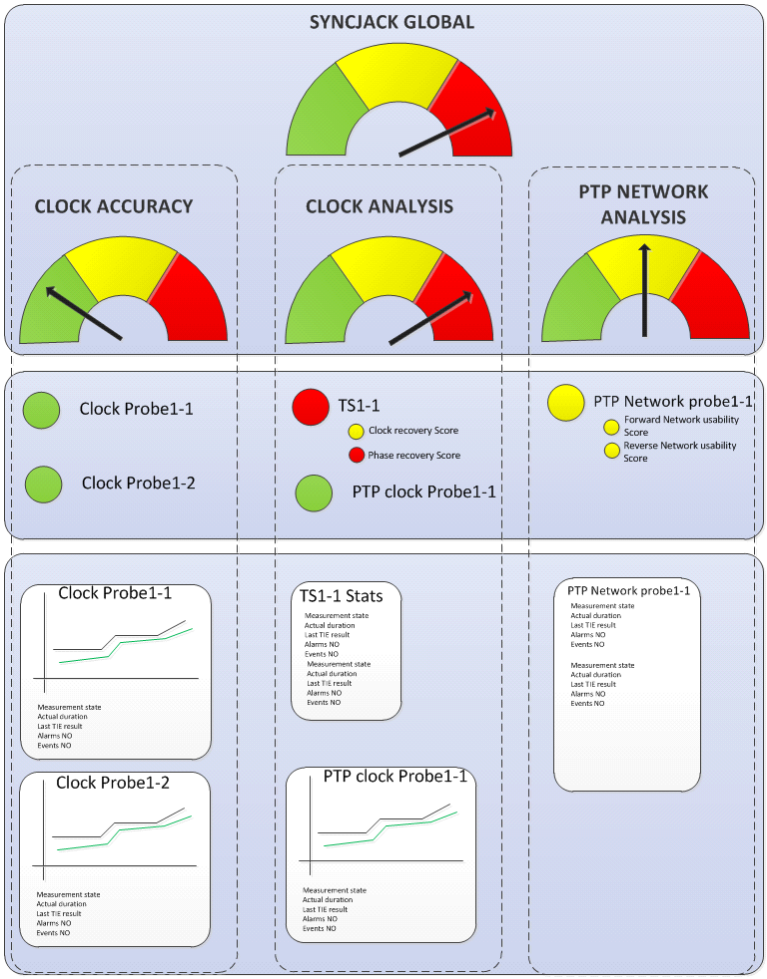
Figure 2: Syncjack GUI Concept



The first layer provides global indication of the Synchronization status.

The second layer shows performance indication of each reporting tool.

The third layer provides detailed information for fault localization of performance analysis.

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Document Overview

This manual is provided to help you install, configure and operate the SP-100. This manual provides an introduction to the SP-100, a description of its operation, and a step by step walk-through of the installation process.

This version of the *FSP 150SP-100 Installation and Operations Guide* is applicable to the SP-100 software release 6.1.1. For defect resolution and functional additions please refer to the Release Notes.

Although this document focuses primarily on using the eVision web browser for configuring and monitoring the SP-100, equivalent CLI or SNMP commands may be used. For more information regarding the CLI command structure, refer to the *FSP 150SP-100 Command Line Interface Reference Guide*. For more information regarding the SNMP command structure, refer to the *FSP 150SP-100 SNMP Reference Manual*.

Before installing and provisioning the SP-100, familiarize yourself with the SP-100 equipment, its functions and requirements. The following chapters support the installation and operation of the SP-100:

Chapter 1, SP-100 Overview contains product overview information and feature descriptions.

Chapter 2, Physical Installation contains procedures to physically install the SP-100 and contains a recommended work flow sequence for new installations, including support for software upgrades.

Chapter 3, eVision Web Browser Management Tool contains an overview of the eVision web browser management tool workspace and contains procedures for logging in and logging off.

Chapter 4, Operations Provisioning contains step by step operations and provisioning procedures for the SP-100 system. It is organized in the recommended workflow for new installations and can be applied to existing systems.

Chapter 5, Communications Provisioning contains step by step procedures for provisioning the SP-100 communications interfaces. It is organized in the recommended workflow for new installations and can be applied to existing systems.

Chapter 6, Etherjack®/Syncjack® Testing Procedures, and Performance Monitoring contains information on service loopbacks and step by step procedures for performing Syncjack tests. This chapter also contains step by step procedures for viewing PM counters, setting thresholds and initializing counters.

Chapter 7, Alarms, Events and Probable Causes contains listing of all alarms and events generated by the system and includes the probable cause of each.

Chapter 8, Provisioning Rules contains configuration option setting information to be used as a guide to plan, operate, configure and maintain the SP-100. It contains system default settings, configuration options and provisioning rules using the eVision web browser management tool. High level descriptions and provisioning rules are provided for each eVision configuration option. Additional information for each option description can be found in the *Technical Descriptions* document and *Application Notes* for specific features. For CLI option settings and rules, refer to the *FSP 150SP-100 Command Line Reference Guide*.

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Audience

The reader must have sufficient knowledge of the following when using this document:

- Internet Protocol (IP) addressing
- Network port facility provisioning requirements
- Access port Ethernet Virtual Circuit (EVC) provisioning requirements
- fiber handling and cleaning procedures (if connecting fiber cables)
- power handling and connection procedures (if connecting DC power)

Related Documentation

Refer to the following documents for additional information about the FSP 150SP-100:

- *FSP 150SP-100 Command Line Reference Guide*
- *FSP 150SP-100 Technical Descriptions*
- *FSP 150SP-100 Quick Start Guide*
- *FSP 150SP-100 SNMP Reference Manual*
- *Safety Guide*

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98617 Meiningen-Dreissigacker
Germany

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ADVA Optical Networking's service options include:

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- web-based support tools
- on-site support
- technical training, both on-site and at company facilities in Germany, the UK and the USA
- expedited repair service
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Contact your local sales office for information on obtaining a customer login.

Access your customer login via the home page at
`http://www.advaoptical.com`

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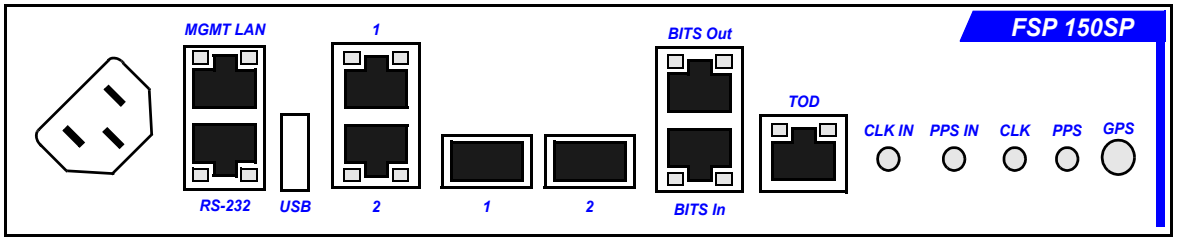
SP-100 Product Overview

The SP-100 is a small, efficient device that brings the power of Syncjack/Syncprobe to any network.

Figure 3: SP-100 Chassis



No longer must archaic legacy synchronous links be maintained for timing. Instead, timing can be easily distributed and assured throughout a network over existing packet infrastructure. Timing performance is continuously monitored, in service, and alarmed if needed. A valuable new service is made available to Ethernet wholesalers and mobile operators: the ability to write and bill to Service Level Agreements on timing or to assure timing with Mobile Network Operator.

Offering unique flexibility, the SP-100 simultaneously supports both Synchronous Ethernet and IEEE 1588v2 PTP. It has a built-in Global Positioning System (GPS) receiver that can be used as the Syncjack tools measurements reference as well as an alternative timing source for frequency and time-of-day delivery. With its thorough IEEE 1588v2 PTP implementation, the SP-100 can be configured to operate in Slave, Boundary Clock (BC) or Master Clock (MC) mode to enable highly accurate clock recovery. An internal Stratum-3 clock is capable of holdover to support remote site, head-end and feeder applications. The SP-100 utilizes the following Syncjack functions and tools.

The FSP 150 family of Ethernet access products provides devices for Ethernet demarcation, extension and aggregation to support delivery of intelligent Ethernet services, both in-region and out-of-region. The SP-100 product targets the Ethernet Access Market.

Optimized for wireless backhaul, the FSP 150CC NIDs enable delivery of Ethernet services as well as highly accurate synchronization over a fiber-based access network in a temperature-hardened platform ideal for remote cabinets. Synchronous Ethernet support includes in-band transmission (with clock / Building Integrated Timing Supply [BITS] outputs), external sync inputs (with BITS / clock inputs) plus an internal Stratum 3 clock capable of holdover to support remote site and head-end or feeder applications. The FSP 150SP enables traditional T1/E1, SONET/SDH or GPS based synchronization to be replaced with Ethernet synchronization based on ITU G.8261 / G.8262 / G.8264 and / or IEEE 1588v2.

The SP-100 product is a 1U high, half-width chassis, with non-redundant modular Power Supply Unit (PSU) (AC or DC).

The SP-100 product provides one Ethernet service port (configurable as either copper [10/100/1000 BaseT] or optical [100BaseFX/ 1000BaseX]) and one Ethernet Network port (configurable as either copper [100/1000 BaseT] or opti-

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cal [100BaseFX/ 1000BaseX]). Copper SFPs are also supported on Access and Network interfaces. See the following figure.

The SP-100 chassis is 44 mm high, 220 mm wide and 212 mm deep. The SP-100 is convection cooled (no fans or filters) and is designed for use in a desktop or communications closet environment.

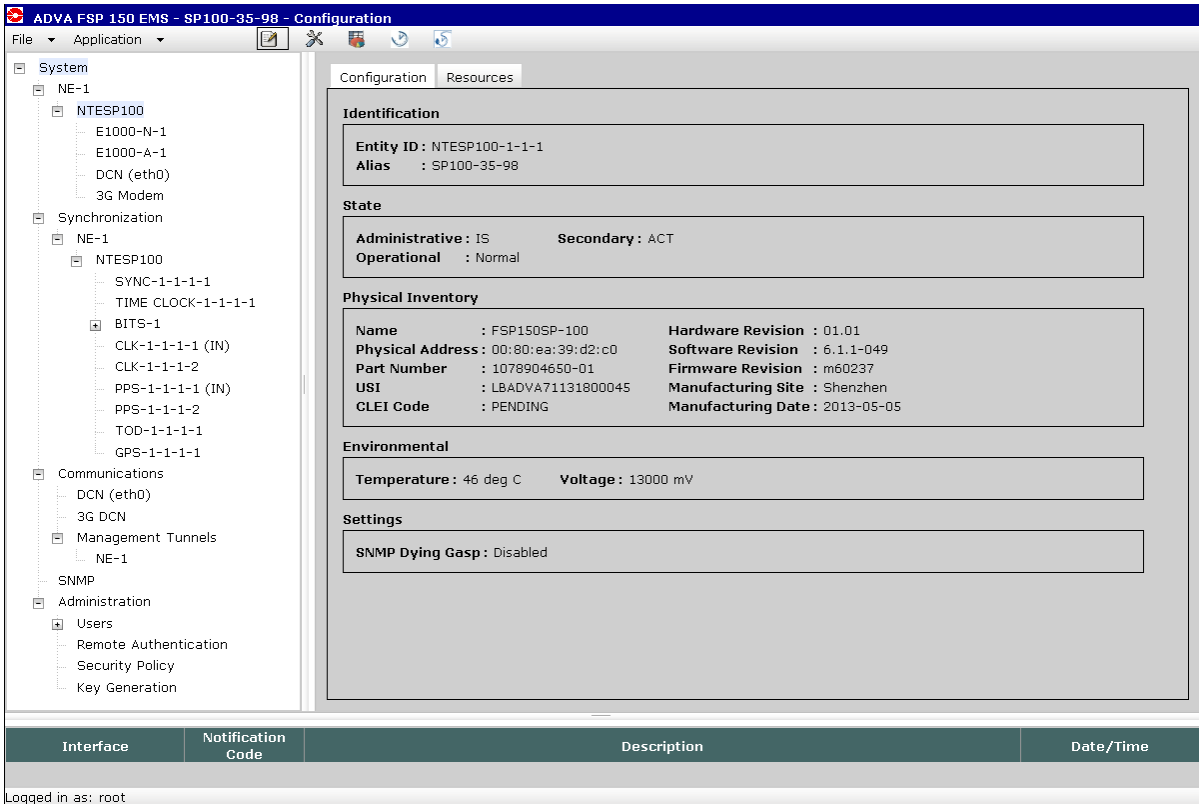
Multiple units may be stacked up to 4 rows high, depending on the operating environment. (Refer to the *FSP 150SP-100 Technical Descriptions* document for air flow requirement details.) A wall-mount / rack-mount kit may be ordered separately. One mounting kit is applicable to a variety of mounting environments (see the *FSP 150SP-100 Technical Descriptions* document for mounting kit details).

A detailed list of system features is provided in the *FSP 150SP-100 Technical Descriptions* document.

eVision Web Browser Management Tool

The SP-100 supports an eVision web browser management tool to provide a web based Graphical User Interface (GUI) for Operation, Administration and Maintenance (OA&M) functions. For more information on eVision web browser management tool operation, see Chapter 3: eVision Web Browser Management Tool.

Figure 4: eVision Web Browser Management Tool



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Command Line Interface

Although this document focuses on using the eVision web browser for configuring and monitoring the SP-100, equivalent CLI commands may be used. The CLI command structure provides a text-based system for local configuration and management of SP-100 functions. CLI access may be attained via RS-232 Serial Console Port direct connection, or telnet / ssh session. For more information regarding the CLI command structure, refer to the *FSP 150SP-100 Command Line Interface Reference Guide*.

Simple Network Management Protocol (SNMP)

Although this document focuses on using the eVision web browser for configuring and monitoring the SP-100, equivalent SNMP commands may be used. The SP-100 SNMP MIB provides a system for remote configuration and management of SP-100 functions. For more information regarding the SNMP command structure, refer to the *FSP 150SP-100 SNMP Reference Manual*.

Syncjack™ Suite

Syncjack™ is a comprehensive technology for timing distribution, monitoring and timing service assurance. There are three main functions: clock accuracy, clock analysis, and PTP network analysis. Syncjack measures the frequency and phase accuracy relative to the sync reference, which can be internal, external, recovered, or from GPS signal. Syncjack continuously performs clock analysis, including frequency and phase accuracy of packet domain, even when a sync reference is unavailable. Syncjack also continuously performs PTP network analysis, including monitoring and testing on PTP communication path.

The SP-100 uses three of the tools in Syncjack: Clock Probe, PTP Clock Probe or PTP Network Probe. The Clock Probe is used to measure clock frequency and phase accuracy. The PTP Clock Probe is used for PTP clock analysis while the PTP Network Probe is used for network analysis of PTP message transport.

Note

In order to measure meaningful results, the accuracy of the reference used by the probes should be accurate by at least one order of magnitude compared to the signal under test; i.e., when using GPS as a reference, the time error generated by the GPS/GNSS receiver/PRTC can be up to 100 +/- nsec (according to G.8272) - therefore, the TE/TIE/MTIE can be effected by the GPS reference time error and wander.

The Syncjack suite is comprised on Syncjack Network Management System (NMS) and Syncjack embedded applications (see Figure 5 on p. 31).

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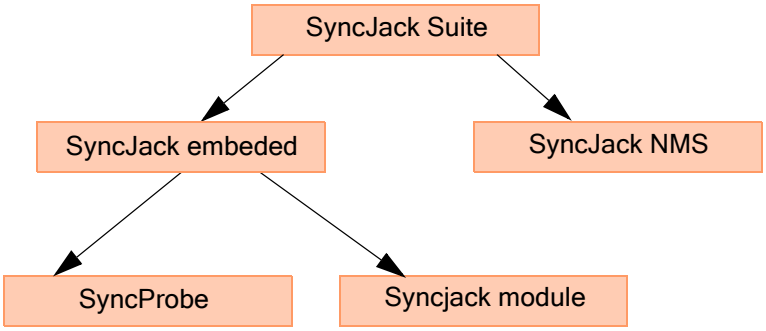
Figure 5: SyncJack Suite



Syncjack NMS is used for collecting and presentation of the Syncjack information. Syncjack embedded is an application that runs on a device. This application may be ported to an Fiber Service Platform (FSP) 150CC NID device, such as the GE206V (Syncjack module) or may be implemented as a Standalone device (SP-100)

Syncjack is a collection of monitoring and measurement tools that allows maintenance and performance monitoring of synchronization services.

SP-100 is a low cost Synchronization Network testing and monitoring device that runs Syncjack applications.

SP-100 has the following properties:

- One Network Port and one Access Port interface
- PTP functionality (Telecom Slave/Boundary Clock/Master Clock)
- Support for Syncjack applications
- Embedded GPS receiver
- Interfaces for external clock inputs
- Timing output Interfaces

SP-100 provides the following capabilities:

- Active /Passive Probing and monitoring of multiple telecom physical signals as well as multiple packet timing signals
- Probing of physical signals, packet timing signals and the network can be done simultaneously - ease finding correlation between network impairments and clock performance
- Bi-directional Probing of network Packet Delay Variation (PDV)
- Measurement network asymmetry
- Integrated Master/Slave/BC
- Can be used as In-service or Portable solution
- Packet Classification
- PDV and Path Delay recording
- Multiple channel testing (2 Clock probes, 4 PTP clock Probes)
- Any-to-any ratio clocks of source/reference testing

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- 1PPS alignment test
- SyncE wander testing
- Local oscillator - Stratum3+/3E (optional)
- 8nsec timestamp resolution

SP-100 can be used for the following:

- Sync delivery using Boundary Clock/Master Clock
- Sync delivery using Telecom Slave
- Field Active/Passive probing and monitoring of Sync (Sync SLA, network PDV)
- First level testing (pre-sale)

Main features of SP-100:

- Timing SLA Tools:
  - Clock Accuracy (2 Clock Probes - MTIE of physical clocks)
  - Clock Analysis (4 PTP Clock Probes – packet MTIE)
  - PTP Network Analysis (1 PTP network Probe – PDV statistics)
- Sync Delivery Tools:
  - 1588v2 Ordinary Slave
  - 1588v2 Boundary Clock
  - 1588v2 Grand Master
- Monitoring of Active master and redundant masters of the downstream PTP Slave
- Topology discovery

SP-100 may be installed in the synchronization Network via one of the following main operation modes.

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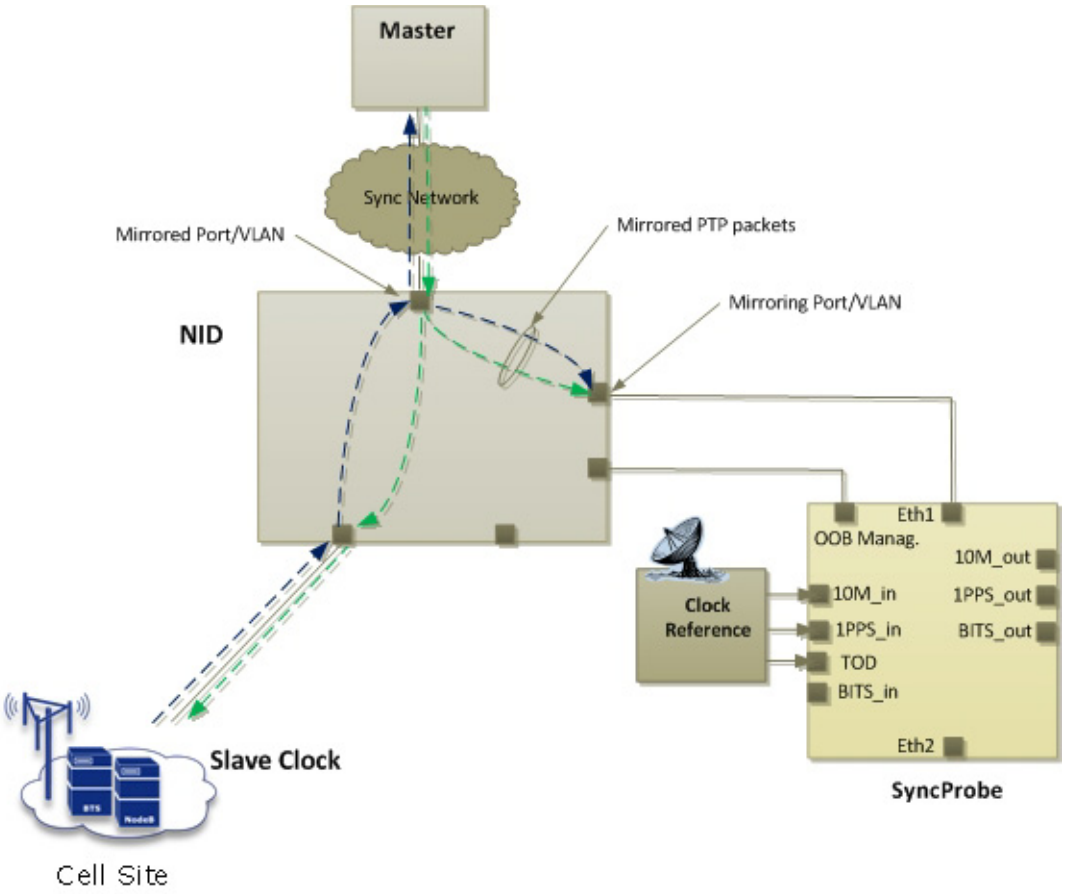
Tapping Mode

Refer to the following figure for an overview of Tapping Mode interconnectivity and the following description of its function:

Figure 6: Tapping Mode Operation



Networking requirements:

- NID must support mirroring

Clock Accuracy:

- Measures the accuracy of the incoming SyncE clock with respect to a measurement reference timing signal

Clock Analysis:

- Estimates the accuracy of the phase and frequency recovered by the Slave clock under test with respect to a reference timing signal based on t_3 timestamps in mirrored Delay_Req messages
- Can also estimate the accuracy of the Master based on t_1 timestamps in mirrored Sync messages

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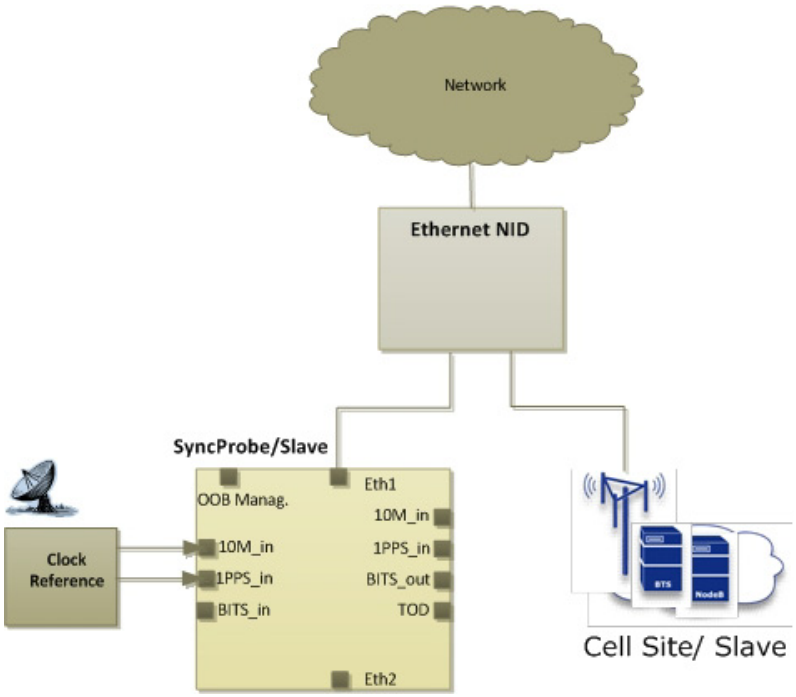
PTP Network Analysis:

- Provides performance metrics for mirrored PTP event messages

Parallel Mode

Refer to the following figure for an overview of Parallel Mode interconnectivity and the following description of its function:

Figure 7: Parallel Mode Operation



In this mode, SP-100 runs Slave clock (OC-S).

Clock Accuracy:

- Measures the accuracy of the phase and frequency recovered by the internal Slave clock with respect to a reference timing signal
- Measures the accuracy of the incoming SyncE clock with respect to a reference timing signal

Clock Analysis:

- Assesses the performance of the internal clock recovery function when a reference time signal is not available

PTP Network Analysis:

- Provides performance metrics for PTP event messages
- Assigns usability score to the PTP network

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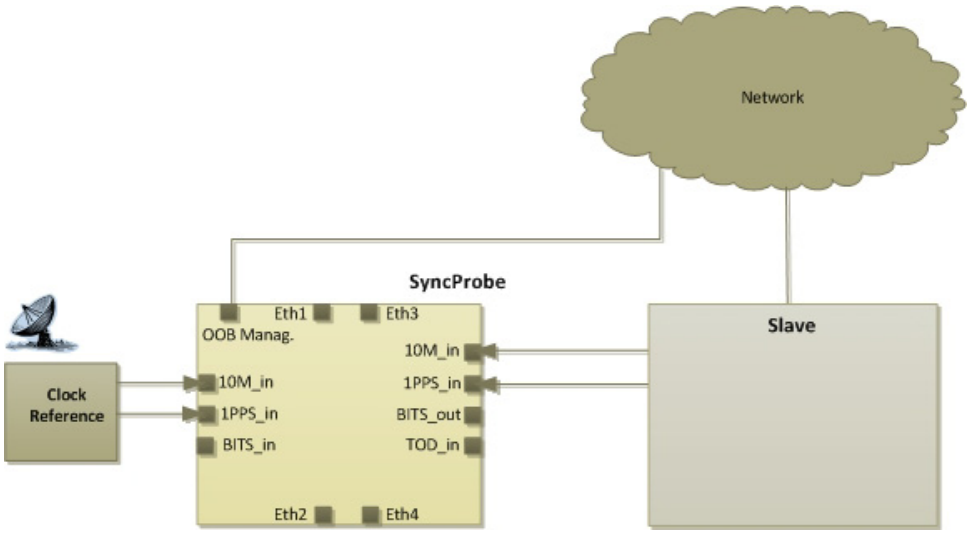
In Parallel Mode operation, SP-100 may also be used for clock recovery and hand off to the client equipment.

Tester Mode

Refer to the following figure for an overview of Tester Mode interconnectivity and the following description of its function:

Figure 8: Tester Mode Operation



SP-100 connects to the clock under test via dedicated timing interfaces (BITS, 10M, 1PPS, TOD).

Traffic interfaces may be used for in-band management and SyncE testing.

Clock under test may not be PTP capable (e.g. SSU, legacy BTS, NodeB with no PTP support).

Applications:

- Measurement of the accuracy of the phase and frequency recovered by the clock under test with respect to a reference timing signal
- Enable mode (BC)
- GM Mode (MC)

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Clock Accuracy

The Clock Accuracy function measures the accuracy of the phase or frequency recovered by the clock under test with respect to a measurement reference timing signal.

Two Clock Probes are supported:

- Clock Probes are functional entities that perform Time Interval Error (TIE) measurements
- Both can be active at any time

Clock probes measure TIE between a source timing signal and a measurement reference timing signal, and can maintain up to sixteen (16) historical TIE measurements.

TIE results are processed and can be presented as:

- Maximum Time Interval Error (MTIE) - Plots MTIE results Vs. standardized masks
- Phase Offset - Calculates and presents phase offset results

Figure 9: Clock Probe MTIE Results

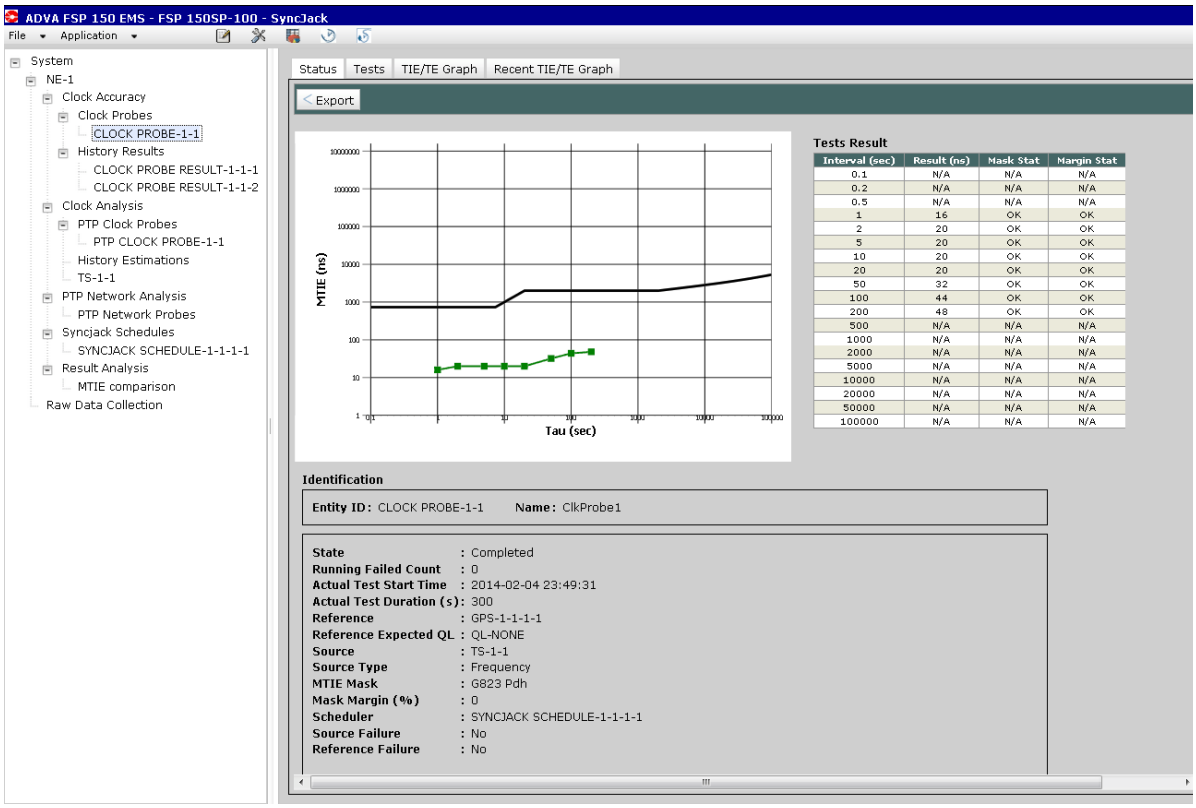

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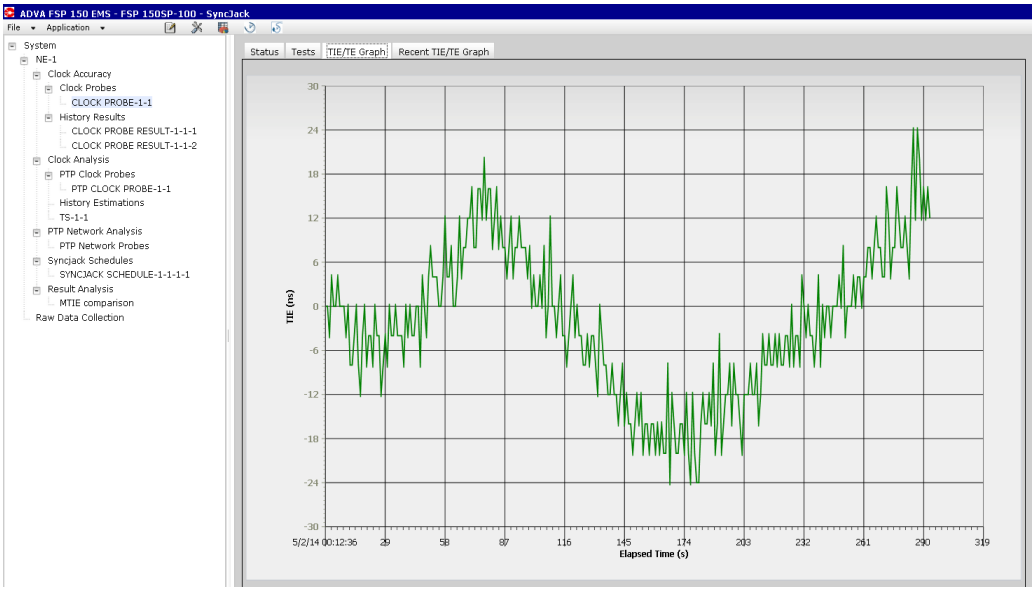
Figure 10: Clock Probe Result in TIE Graph



Reference and Source Signal

Reference time input can be:

- BITS-IN, SyncE port, 10 MHz port, 1PPS port or PPS signal from the embedded GPS receiver

Source time options are:

- OC-S recovered phase or frequency, System Clock (EEC), external PPS signal (from the 1PPS port), external 10 MHz signal (from the 10MHz port), external T1/E1/2048 KHz signal (from the BITS-IN port)
- recovered clock from GPS/TS/SyncE

Reference and source signals are continuously monitored for accuracy qualification

- "Source failure" or "Reference failure" is reported if a fault is detected
- Faults can be physical defects (e.g., LOS, Loss of Link) or clock signal defects such as excessive frequency deviation, SSM-QL falling below a configurable value, ESMC failure, etc.

TIE Post Processing

TIE post processing consists of the following:

Maximum Time Interval Error (MTIE) - the maximum peak-to-peak delay variation of a given timing signal with respect to an ideal timing signal within an observation time (t=nt0) for all observation times of that length within the measurement period (T).

- Observation interval range: 0.1 to 100,000 seconds
  - Three observation intervals per decade

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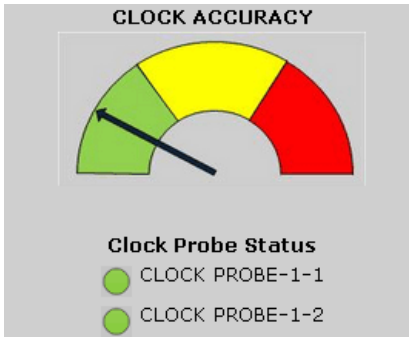
- Standardized MTIE masks
- TCA generation for MTIE mask crossing and margin crossing events

Clock Accuracy Status (GUI)

The GUI provides an overall status of the Clock Accuracy function shown as Green, Yellow or Red in the GUI. The status of each configured Clock Probe is also provided (see the following figure).

Figure 11: Clock Accuracy Status



Clock Analysis

The Clock Analysis function:

- Assesses the performance of the internal clock recovery algorithm when a reference timing signal is not available
- Provides status and statistics of the internal Slave clock
- Estimates the accuracy of the phase and frequency recovered by the clock under test with respect to a reference timing signal by analyzing timestamps in mirrored PTP event messages

Frequency Performance Estimation

Frequency Performance Estimation:

- Uses a score for the assessment of the frequency recovery performance
  - Assigned based on the performance of the PTP network, clock traceability status, OCXO stability, device temperature change, etc.
  - Score can be in the range of 3 to 5
- Score 5 – Green
  - High confidence that the recovered frequency is within the performance target range

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- Score 4 – Yellow
  - Low confidence that the recovered frequency is within the performance target range
- Score 3 – Red
  - Bad performance - the recovered frequency may not be within the performance target range
- Performance target range is configured as an MTIE mask
- Clock recovery score statistics are collected and binned

Phase Performance Estimation

- Phase Performance Estimation uses a score for the assessment of the phase recovery performance
  - Score can be in the range of 3 to 5
- Score 5 – Green
  - High confidence that the recovered phase is within the max specified phase error
- Score 4 – Yellow
  - Low confidence that the recovered phase is within the max specified phase error
- Score 3 – Red
  - Bad performance – the recovered phase may not be within the max specified phase error
- Performance target is configured as maximum allowed phase error
- Clock recovery score statistics are collected and binned

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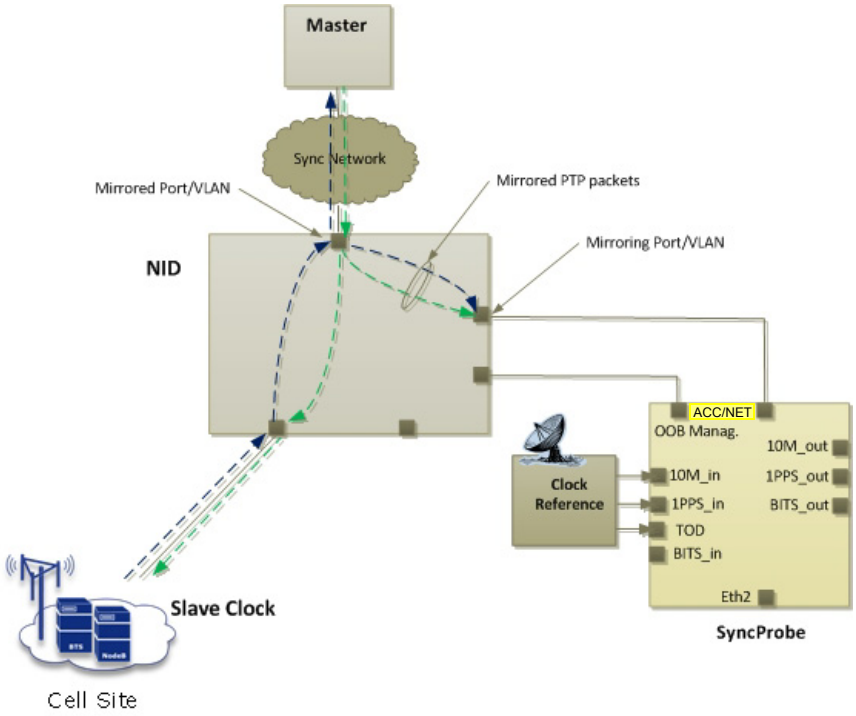
PTP Clock Probe

PTP Clock Probe is the functional entity that measures the TIE between the clock under test and the reference timing signal.

- Supports up to four (4) PTP clock probes
- All probes share the same reference timing signal
- Maintains up to sixteen (16) TIE history bins

Figure 12: PTP Clock Probe - Tapping Mode Operation



PTP Clock Probe can estimate the accuracy of the phase and frequency recovered by the Slave under test with respect to a time reference signal based on mirrored t_3 timestamps in PTP Delay_Req messages.

PTP Clock Probe can estimate the phase and frequency generated by the Master with respect to a reference time signal based on mirrored t_1 timestamps in PTP Sync messages.

Refer to the following figure for example PTP Clock Probe test results.

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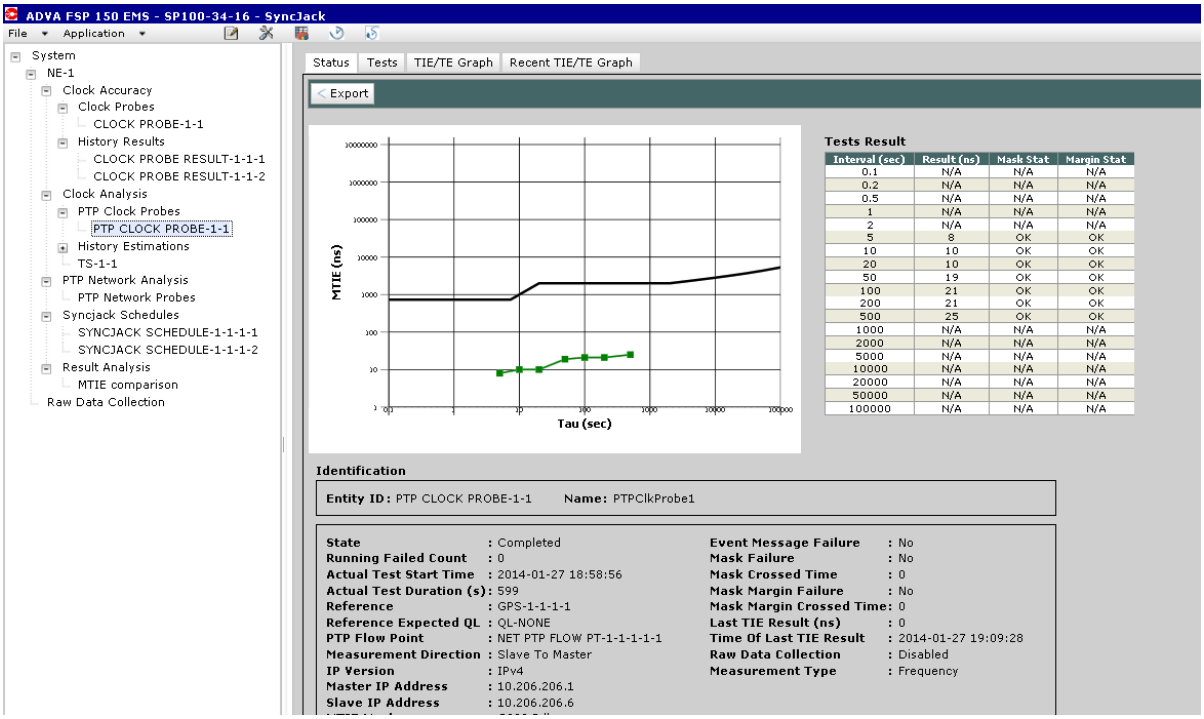
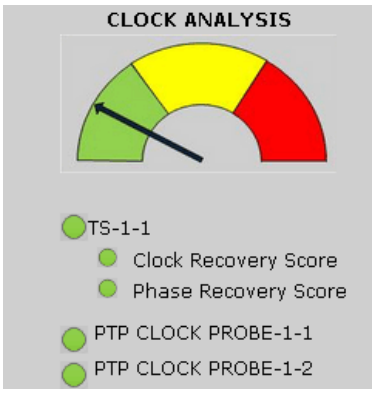
Figure 13: SyncJack PTP Clock Probe State - Completed



Clock Analysis Status (GUI)

The GUI provides an overall status of the Clock Analysis function shown as Green, Yellow or Red in the GUI. The status of each configured PTP Clock Probe is also provided (see the following figure).

Figure 14: Clock Analysis Status



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PTP Network Analysis

PTP Network Analysis provides a PTP usability score based on packet delay, packet delay variation and packet loss statistics of PTP event messages.

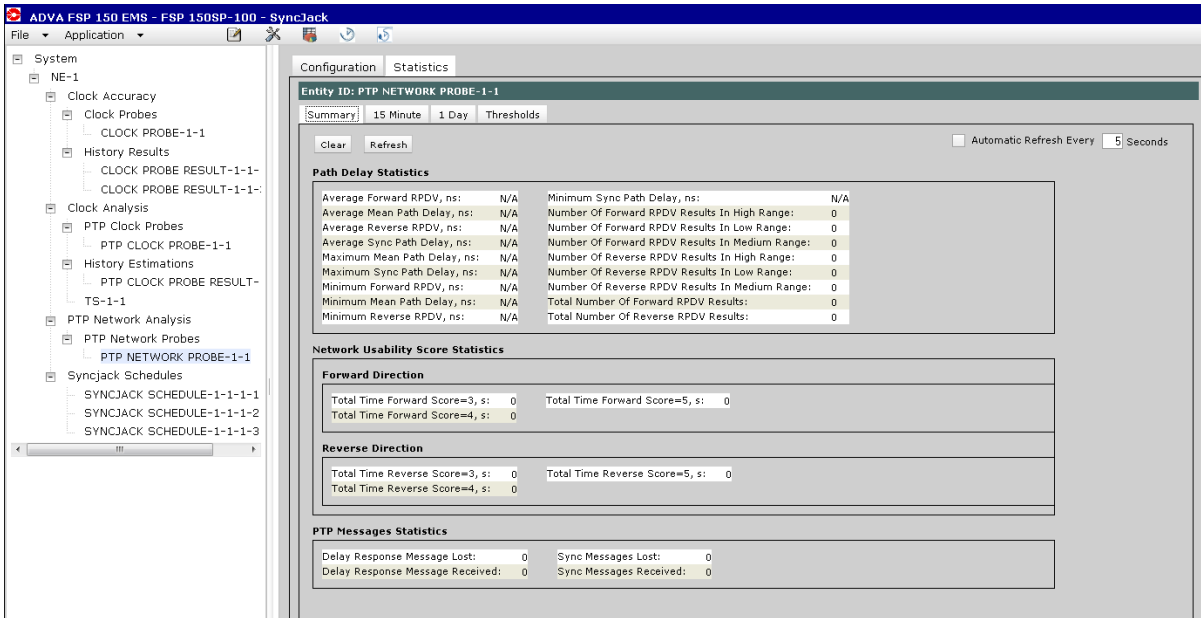
PTP Network Analysis does not require but may use a reference timing signal.

PTP Network Analysis supports one PTP Network Probe:

- Functional entity that carries out PD, PDV and packet loss measurements and provides performance metrics
- In diagnostic mode, raw PD and PDV data are collected and processed producing performance metrics such as MinTDVE, MAFE, etc.

The following figure shows an example of PTP Network Probe Statistics results.

Figure 15: PTP Network Probe Statistics



PTP Network Usability Score

A score is provided for each direction separately – forward and reverse:

- Calculated based on PDV Network Limit definition as specified by G.8261.1
- Cluster range is configurable for each score
- Score can be in the range of 0, and 3 to 5

Score 5 – Green:

- PTP event messages can be safely used for successful clock recovery - for any window interval of 200 seconds (jumping window), at least 1% of timing packets, with a minimum of 2 timing packets, must be observed within a

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fixed cluster, located at the observed floor delay, and having a range required by the clock recovery algorithm to meet the performance objectives

Score 4 – Yellow:

- PTP event messages may not meet the requirements for successful clock recovery

Score 3 – Red:

- PTP event messages cannot be used for successful clock recovery

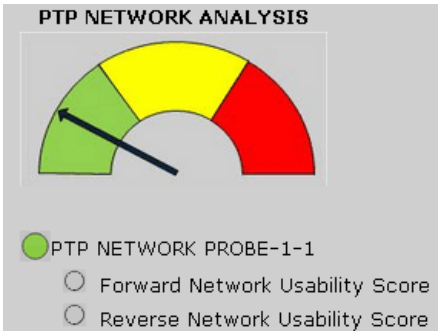
Score 0 - Gray:

- No score has been calculated yet

PTP Network Analysis Status (GUI)

The GUI provides an overall status of the PTP Network Analysis function shown as Green, Yellow or Red in the GUI. The status of PTP Network Probe and Network Usability Score for each direction is also provided (see the following figure).

Figure 16: PTP Network Status



Product Applications

Timing and Synchronization

The SP-100 is equipped with an internal clocks with an accuracy of +/-4ppm and the performance in hold-over mode meets the requirements identified in ITU-T G.8262 Option 1.

Synchronous Ethernet

The SP-100 supports Synchronous Ethernet according to ITU-T G.8261 for frequency distribution over Ethernet networks, and can use any Network or Access Port, or an E1 or T1 BITS clock.

Ethernet interfaces can be configured in synchronous operation mode or non-synchronous operation mode. Synchronous operation mode can be

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enabled or disabled on a per port basis. Default is non-synchronous operation mode.

In synchronous operation mode, in the receive direction, the port is able to recover the clock from the incoming signal. This recovered clock provides the stable reference to the system clock from which the transmit clock for ports is derived. Ports can be enabled to process the Ethernet Synchronization Messaging Channel (ESMC) and extract the encoded Synchronization Status Message Quality Level (SSM-QL) value. In the transmit direction, ports are locked to a common clock derived from the system clock and can be enabled to insert the ESMC channel with the appropriate SSM-QL value.

In non-synchronous operation mode, in the receive direction, the port's recovered clock is not used by the system clock and the port does not terminate the ESMC channel. In the transmit direction, the port may be locked to the system clock (which is either synchronized to another reference clock or is free running) but does not generate an ESMC channel.

System Clock Reference

The system clock on the SP-100 can be synchronized to one of several timing references:

- the recovered clock of an Ethernet port operating in Synchronous Ethernet mode
- an external clock provided on the Building Integrated Timing Supply (BITS) input port, a 10MHZ Clock (CLK) input port, a PPS input port or GPS signal.
- an internal crystal oscillator

Synchronous Ethernet interfaces, CLK IN and the BITS IN port can be selected as synchronization sources and can be assigned an expected SSM-QL value.

If the selected synchronization input(s) fails, the SP-100 product automatically switches either to holdover or free-running. Holdover is used if the internal clock was locked to the reference. The accuracy of the internal clock is +/-4ppm and the performance in hold-over mode meets the requirements identified in ITU-T G.8262 Option 1. Free-running is used if the internal clock was not locked to the selected reference. The switchover can occur as soon as the fault condition is detected or after a configurable hold-over timer has elapsed. Synchronization source switchover can be triggered by physical link defects (LoS) or changes in the received quality level (SSM-QL).

The BITS output, CLK and PPS ports can feed legacy devices or synchronization equipment such as SSUs or SASEs. The BITS OUT and CLK ports can be assigned a SSM-QL.

In the diagrams below the SP-100 distributes the frequency reference to a legacy base station via BITS output port and to a new generation base station via a Synchronous Ethernet (Sync-E) interface.

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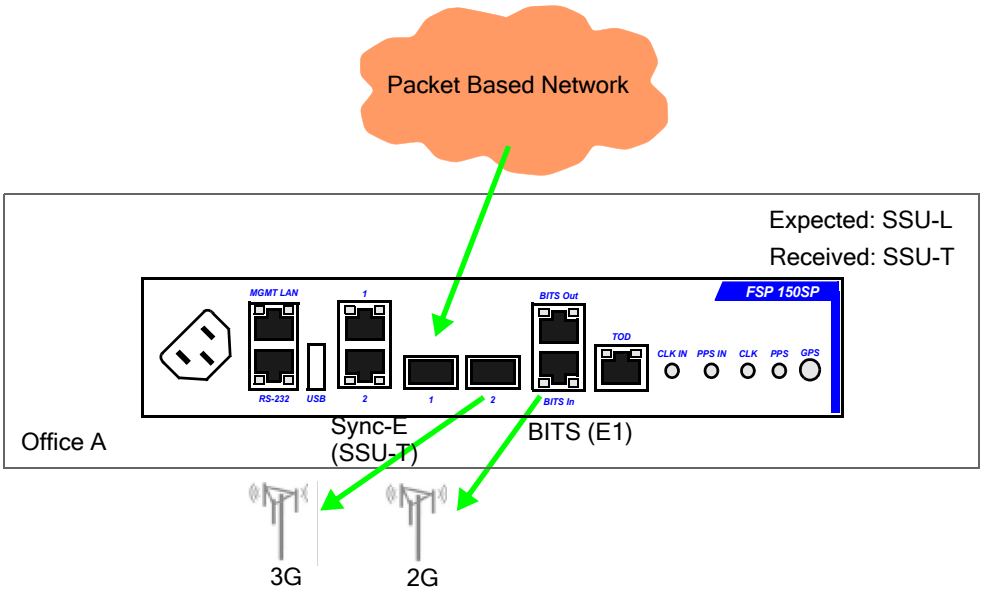
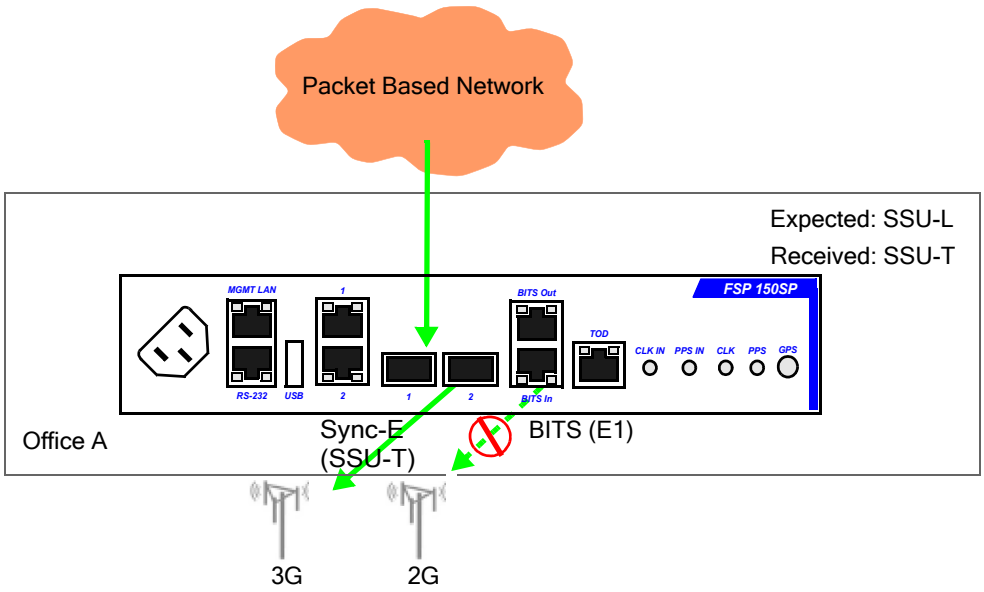
Figure 17: Frequency Distribution via BITS Output Port and Sync-E Interface



If the synchronization quality of the BITS, CLK or PPS output port falls below the configured SSM-QL value, the port can be switched off (squelched).

Figure 18: BITS Output Port Off



Precision Time Protocol (PTP)

Generic synchronization distribution consists of the recovery and distribution of timing to and from a variety of network elements and interface types. Historically, networks are synchronized by distributing frequency over the physical layer of the transport media (e.g. fiber optic cable for SDH, SONET, and SyncE,

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or twisted pair copper cable for DS1/E1). However, as mobile networks and services grow in sophistication and complexity, the ability to distribute precise time (also referred to as phase) through the network is required. Network Time Protocol (NTP) provides time distribution; however, it does not satisfy the time accuracy and precision requirements for next generation mobile networks.

IEEE 1588-2008 (also known as 1588v2) defines the *Precision Time Protocol* (PTP) which is intended for use in high accuracy time and frequency synchronization applications. PTP is a layer 5 protocol which can be transported over a variety of lower-layer packet technologies (e.g. PTP/UDP/IPv4/ENET, PTP/UDP/IPv6/ENET, PTP/ENET, etc.). It supports both unicast and multicast messaging, and provides message formats for synchronization distribution, delay estimation, signaling, and management purposes.

The PTP protocol enables accurate time transfer between two entities (clocks) by transporting 80-bit timestamps in time-critical packets. Each timestamp represents the time at which the packet was sent and has a 1 nanosecond granularity. Through the use of the CorrectionField in the PTP header, each timestamp can support sub-nanosecond granularity. The periodic transmission of messages is the basis for frequency recovery, while the distribution of the timestamp values allows for accurate phase/time recovery.

Precision Time Protocol (PTP) is a packet based method dedicated to the distribution of time and/or frequency over Packet Switched Networks (PSNs). It is based on a master-slave relationship between the time sources and their time recipients. A time source (herein referred to as a *master*, *Grand Master*, *master clock,* or *Ordinary Clock-Master (OC-M)*), distributes its time and frequency to downstream nodes (referred to as *slaves*, *slave clocks, Slave-Only Ordinary Clocks (SOOC)* via PTP messages. Since the transport mechanism is packet-based, each intermediate node (e.g. router, switch, aggregation Network Element [NE], etc.) between the master and slave clocks introduces packet delay variation (PDV) in the transport of the PTP messages. This creates uncertainty and error in a slave clock's recovered time and frequency.

The *Grandmaster* is the primary time reference source in the packet-based synchronization network. It is equivalent to a PRC/PRS clock in a traditional frequency-based synchronization network. For redundancy, more than one Grandmaster exists within the same network time domain. An SOOC is the recipient of the timing information and synchronizes to the *Grandmaster* to within a specified accuracy/tolerance. For current mobile backhaul applications, *Slave Clock* accuracy is currently required to be within ±1.5µs; however, ±1.0µs has been accepted as the industry requirement with a future target of ±200ns for MIMO applications.

To minimize the effects of PDV, IEEE 1588-2008 defines two additional clock types, a *Boundary Clock*, and a *Transparent Clock*, to account for the variable packet delay incurred by PTP messages while in transit from the master to the slave.

A *Boundary Clock* is typically a multi-port device residing between an upstream master and one or more Slave Clocks. A *Boundary Clock* is similar to an SSU or SEC in SDH, and provides a timing boundary, or partition, between the master and slave clocks. A *Boundary Clock* terminates the PTP messages received from an upstream master clock, recovers the time and/or frequency based on the received PTP messages, and generates new PTP message flows to down-

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stream slave clocks based on its recovered version of the upstream master time/frequency.

A *Transparent Clock* does not participate in the master/slave hierarchy, but instead, measures the *residence time* for each PTP *event* message; i.e. it measures the time a PTP *event* message spends in transit through the Transparent Clock, or more specifically, the time between the ingress point and the egress point in the node. A *Slave Clock* uses the residence times to account for the variable delay (i.e., queuing delay) incurred by a PTP event message while in transit through the network.

IEEE 1588-2008 defines the *Precision Time Protocol* (PTP) for use in applications requiring highly accurate time/phase synchronization. The PTP protocol involves the transmission of messages containing accurate timestamps, with each timestamp representing the time at which the message was sent. The repeated transmission of messages provides the means for frequency recovery, and when combined with the timestamps embedded within the messages, accurate time/phase is also recovered.

The performance achievable by the PTP protocol is dependent on the network environment in which it is operating and the use and performance of the various clock types (e.g. OC, BC, TC) within the network. IEEE 1588-2008 doesn't define the performance criteria for recovering the clock (time and frequency) from a received PTP message flow; however, ITU-T is working on such requirements for telecommunications applications.

To support the accurate transport and recovery of time across a network, IEEE 1588-2008 defines the following clock types to be used to transport time/phase:

Ordinary Clocks

Boundary Clocks

Transparent Clocks

While the standard defines these as "clocks", they are actually logical functions that recover, distribute, and/or support synchronization.

PTP supports both unicast and multicast operation, and also defines support for two clock modes: *one-step* clock mode and *two-step* clock mode.

The *one-step* mode involves embedding the timestamp associated with a message within the message itself, while the *two-step* mode requires the transmission of an additional message for transporting the timestamp of the original message.The implementation in the SP-100 products is the one-step mode.

Because of their logical (versus physical) nature, the FSP150CC products associate each E2E TC function with a specific service flow. The associated service flow may or may not be transporting user traffic along with PTP messages. As a result, each SP-100 product may support many simultaneous E2E TC functions.

Figure 19 on p. 48 shows an example application involving an End-to-End (E2E) Transparent Clock (TC).

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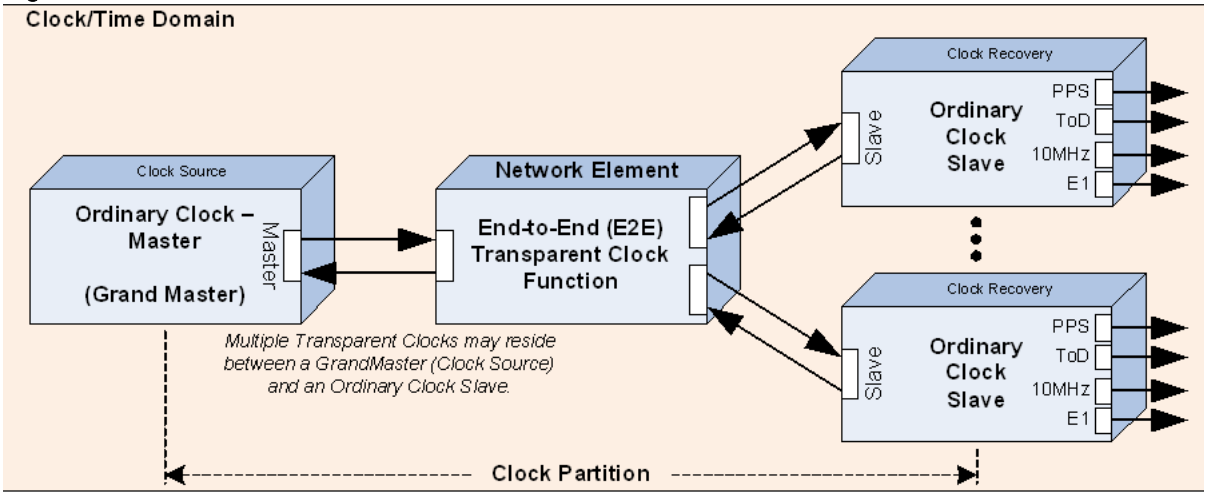
Figure 19: OC-Master, OC-Slave with TC Interconnect



Synchronous networks rely on accurate distribution of frequency in order to optimize transmission and TDM cross-connection. In contrast, packet based networks and services are highly buffered and do not require accurate timing for their operation. But if packet based networks are used to support circuit emulation services, stable frequency is needed at both ends of the service. Stable frequency from one end has to be transported on the packet network and be recovered on the other side. Other applications include wireless access technologies like LTE, WIMAX etc., where the air interfaces have stringent synchronization requirements. Synchronous Ethernet was developed by ITU-T for physical layer frequency distribution. But Synchronous Ethernet may not be a viable option in all cases as it requires transceivers that are capable of extracting accurate frequency from the received signal and hence requires different hardware. This also adds cost to the network devices.

IEEE 1588v2 defines mechanisms to accurately transfer time between two clocks. An IEEE 1588v2 slave is able to compute the time based on a precise timestamp from the master and the delay between master and slave. The accuracy of the time at the slave depends on the accuracy of delay measurement between master and slave. The delay is calculated by halving the round trip time between the master and slave. To increase accuracy, the PTP protocol separates the link level delay which is symmetric and if needed adjusts for fixed asymmetry and variable delay which is mostly within the devices. Another important aspect to improve accuracy of time at slave is for all the timestamps in PTP event messages should recorded as close to the physical interface in ingress and egress direction. To minimize the delay asymmetry between Ordinary Clock Master (OC-M) and Ordinary Clock Slave (OC-S), it is recommended that each device between the OC-M and OC-S provide either a Transparent Clock (TC) if fan-out of timing is not required or a Boundary Clock (BC) if fan-out is required. TC calculates eliminates inaccuracy due to delay asymmetry in a device in either direction by calculating residence time in the device and recording it in the PTP messages passing through. BC involves at least one slave port and one or more master ports where PTP messages are terminated and time is recovered by the slave function and the master ports generate new stream of PTP messages using the time recovered by the slave function.

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ITU-T developed G.8265 and G.8265.1 to specify transport of frequency over packet network using packet-based mechanisms without physical layer timing. Repeated transmission of PTP packets allows recovery of frequency.

Initially version 1 of PTP as define in IEEE 1588-2002 was developed for industrial automation. The second version which is IEEE 1588-2008 was extended to be applicable to other applications such as Telecom. IEEE 1588-2008 defines the concept of PTP profiles which defines required options, prohibited options and ranges/defaults of configurable attributes.

ITU-T G.8265.1 defines a PTP profile for telecom applications using ordinary clocks using PTP over UDP in unicast environment. ITU-T G.8265.1 only defines recovery of frequency and does not cover phase or time-of-day alignment. For accurate frequency recovery it would be ideal to receive the PTP packets with precise time stamps with minimum packet delay variation (PDV). It is not practical in a packet network to expect PTP packets without PDV and this PDV introduces inaccuracy in recovered frequency. The recovery algorithm should try to minimize the impact of PDV on the recovered frequency.

Another important aspect defined by G.8265 and G.8265.1 is the definition of protection schemes for synchronization based on standard operational practices in telecom networks. The key aspects of synchronization in telecom networks is synchronization network is designed and configured in a fixed arrangement. Protection scheme is based on selection between multiple master clocks based on received QL and priority. In IEEE 1588 each PTP port in each ordinary clock and boundary clock runs an independent state machine. Using the Best Master Clock Algorithm (BMCA), contents of all Announce messages received on the port and the data sets of the OC or BC clock data sets are analyzed to determine the state of each port of the clock. This approach makes the timing network dynamic where it is reconfiguring itself by electing a master depending on factors like clock class, clock accuracy and priority of the available timing sources. As mentioned above, this is not suitable for telecom networks.

To support the notion of selection between multiple master clocks, ITU-T G.8265.1 defines Telecom Slave which is the entity that recovers frequency based on timestamps from the selected master clock. An entity called the Slave Only Ordinary Clock (SOOC) is defined which is basically a IEEE 1588 OC-S that gets its PTP packets from a Grand Master (GM). For protection more than one SOOC shall be defined each receiving timing from a different GM. Based on the clock class in Announce messages (QL), priority and Packet Timing Signal Fail (PTSF) master is selected. PTSF is based on PTSF-lossSync, PTSF-lossAnnounce or PTSF-unusable. PTSF-unusable is undefined in G.8265.1 and this could be used to indicate conditions such as the high PDV that could result in inaccurate clock recovery. Today G.8265.1 defines selection only based on the quality of the GM, priority and lack of PTP messages required for clock recovery and does not base selection on network quality between GM and SOOC. This will be an area of future improvement.

The following is the functional model for Boundary Clock and Master Clock.

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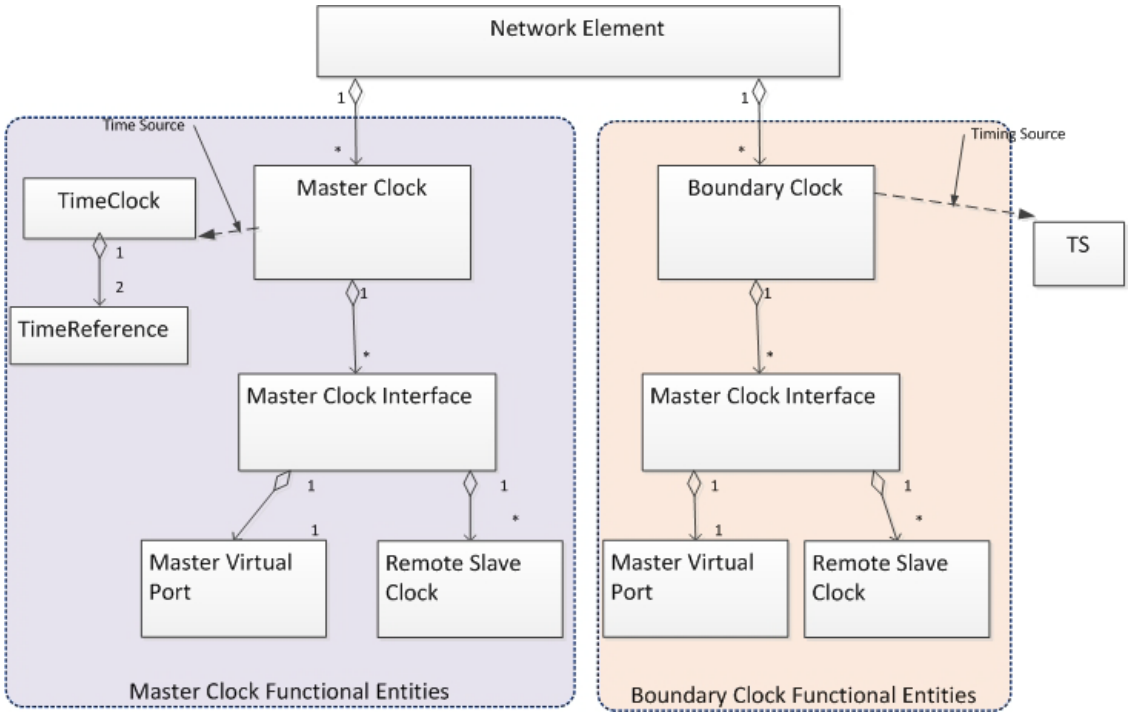
Figure 20: Boundary Clock and Master Clock Functional Model



The following are some terminologies and definitions of the various PTP functional entities:

- **Boundary Clock (BC)** - Boundary Clock maintains timing information of the PTP domain. Boundary Clock is configured with timing source as one of the TS that recovers timing information of the domain.
- **Master Clock (MC)** - Master Clock drives timing information for the PTP domain. Master Clock functionality is similar to the Boundary Clock.
- **TimeClock** - TimeClock represents timing source of the master clock. TimeClock allows configuration of up to two Time References and selection/switchover of the active source
- **TimeReference** - TimeReference represents TimeClock reference signal. Time reference can be set to Internal GPS receiver; TS or System Sync
- **Master Clock Interface (MCI)** - Master Clock Interface serves as PTP master port of the BC or MC and maintains PTP Protocol for the single Ethernet connection.
- **PTP Flowpoint (PTPFP)** - PTP Flowpoint serves as PTP flow termination point. A single PTP Flowpoint may serve several Master Clock Interfaces.

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- **Master Virtual Port** - Master Virtual port is used to bond between specific Master Clock Interface and PTP Flowpoint. The Remote Slaves are served through Master Virtual Port and may be attached in the following ways:
  - With E-Line service while each Master Virtual Port serves single Remote Slave
  - With E-LAN service while each Master Virtual Port serves a number of Remote Slaves
  - E-Line/E-LAN service with Remote Slaves connected with IP Router
- **Remote Slave** - Remote Slave Instance of the Master Clock Interface reproduces OC-S served over this interface. Remote Slave may be of the two types:
  - Static Slave provisioned explicitly for the Master Clock Interface
  - Dynamic Slave discovered by Master Clock Interface by means of Unicast Messages Negotiation Protocol (UMN)
- **Timing Domain** - It is a source of timing that provides frequency and/or phase.
- **SYNC Timing Domain** - It provides only frequency and it involves clock qualification and clock selection. For now all the devices shall support one SYNC Timing Domain which is the System SYNC Timing Domain. SYNC Timing Domain generally involves selection from multiple SYNC references. These SYNC references can be SyncE from Ethernet ports, other forms of frequency inputs like 10MHz, BITS, Time Clock or PTP recovered frequency. Currently the systems supports only System SYNC Timing Domain and one PTP Timing Domain. In the future some devices shall support up to 4 PTP Timing Domains.
- **PTP Timing Domain** - It provides both frequency and phase. PTP Timing Domain involves a Telecom Slave (TS) that selection of a PTP stream from one or more Slave Only Ordinary Clocks (SOOC) and recovering frequency and phase from it.
- **System Clock** - This indicates the frequency output by the System SYNC Timing Domain which is one of the SYNC references of SYNC Entity.
- **SYNC Entity/Object** - This is basically the abstraction of the System SYNC Timing Domain and is used interchangeably with System SYNC Timing Domain.

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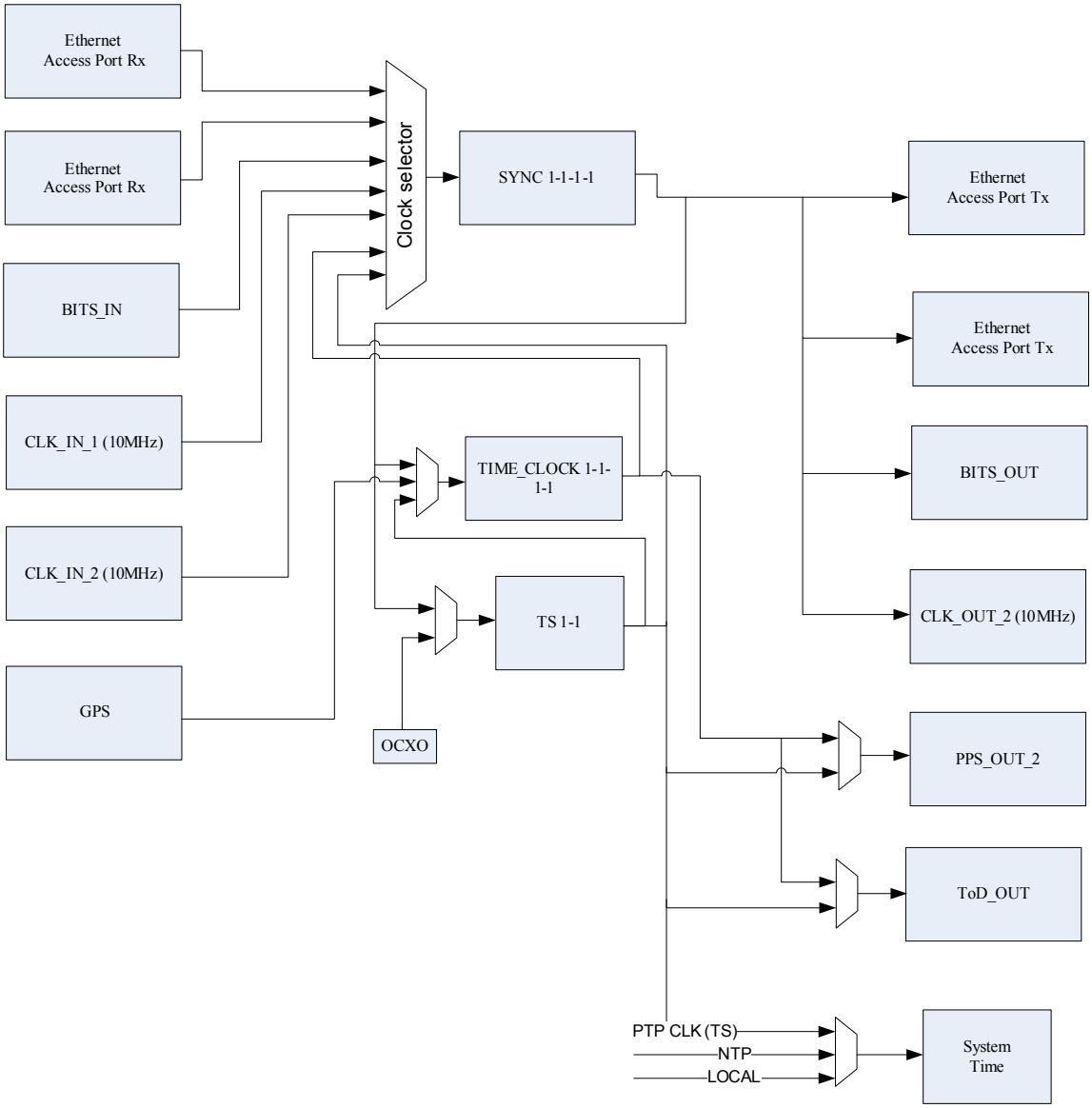
The following figure shows the various clock interface functions and interconnections.

Figure 21: Clock Interface Functions and Interconnections



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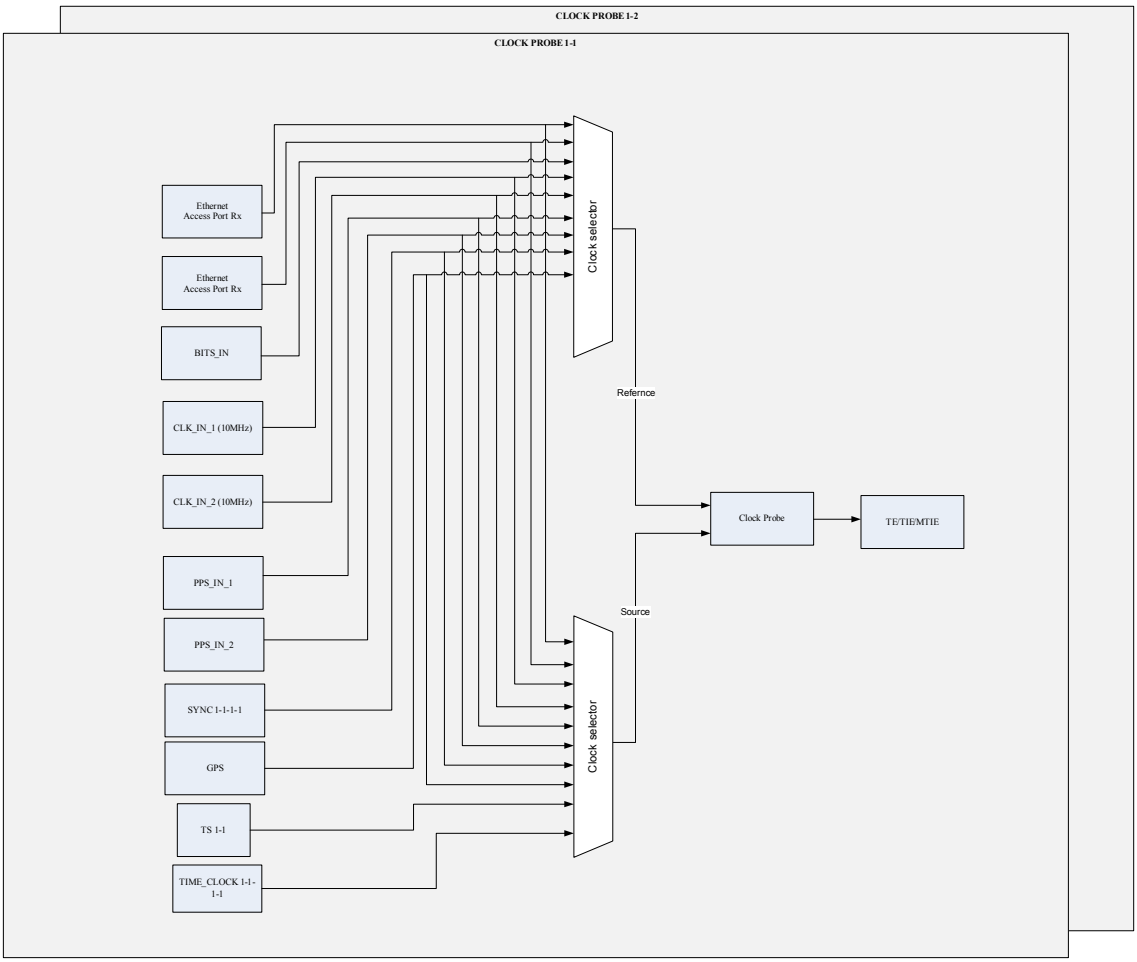
The following figure shows Clock Probes connectivity.

Figure 22: Clock Probes Connectivity



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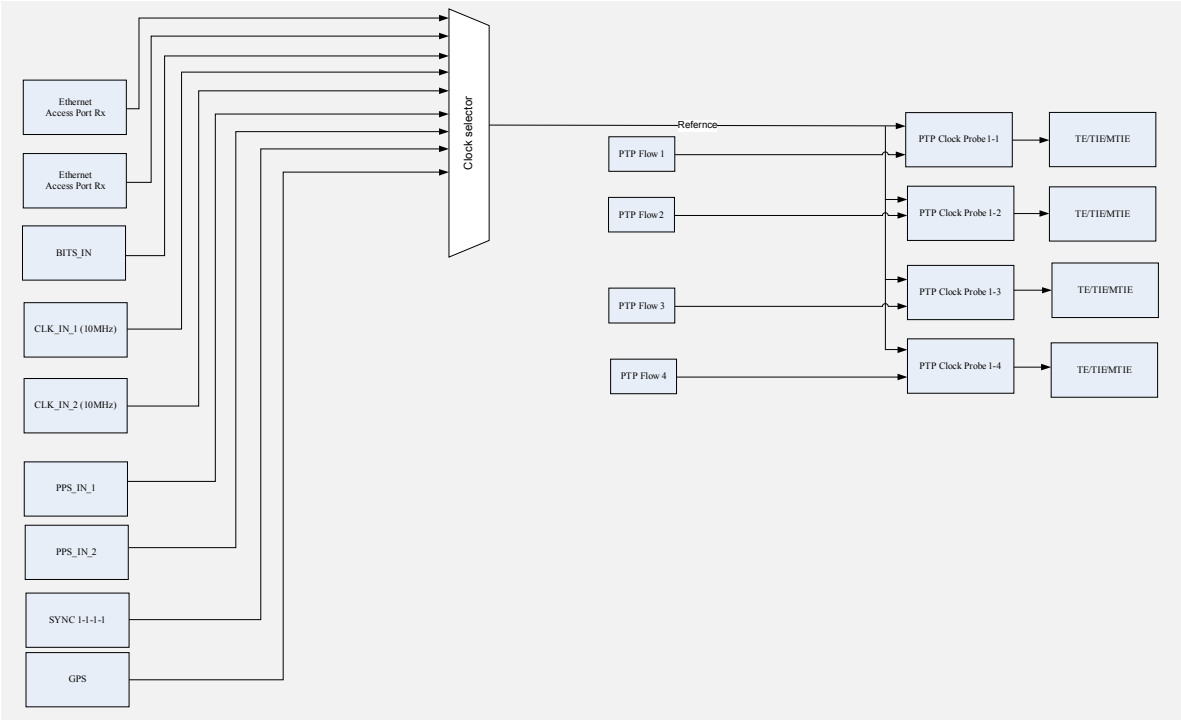
The following figure shows PTP Clock Probes connectivity.

Figure 23: PTP Clock Probes Connectivity



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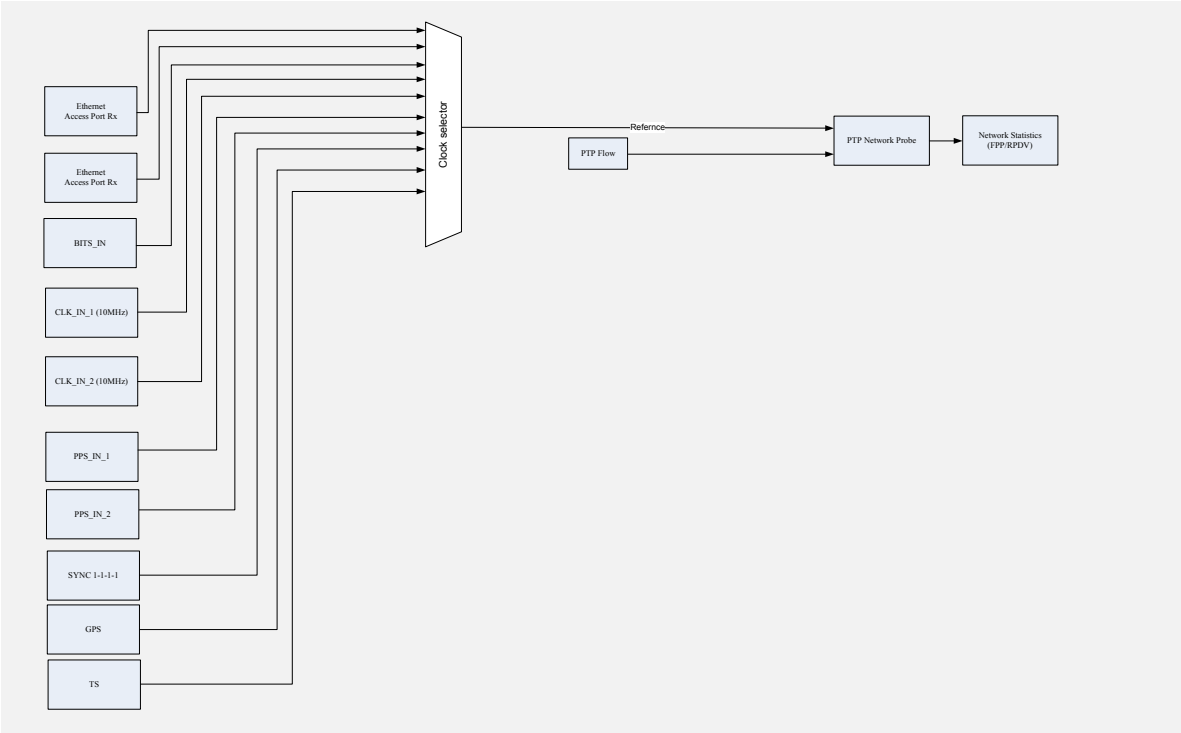
The following figure shows PTP Network Probes connectivity.

Figure 24: PTP Network Probes Connectivity



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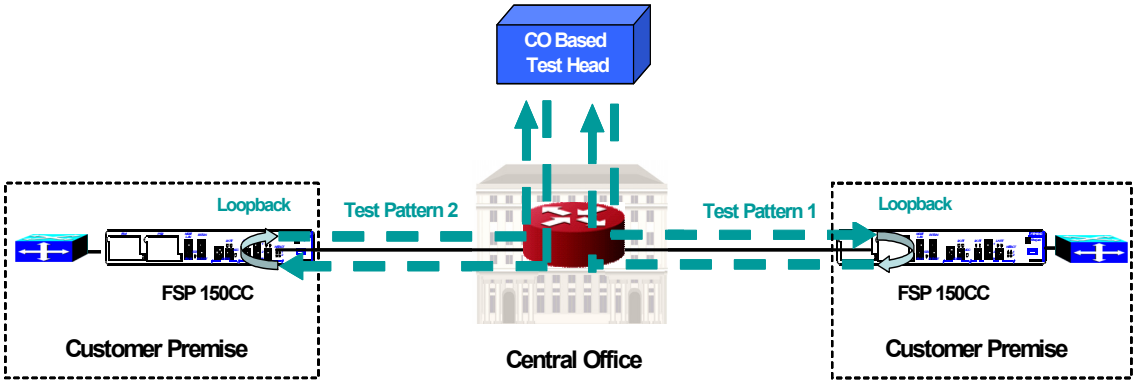
Port Loopback

To assist with Ethernet service fault isolation and ADVA Optical Networking's SP-100 supports port facility loopbacks on the Access and Network ports. This feature allows the operator to set up an Ethernet test-set at a central location to inject traffic into the network.

Figure 25: CO Based Testing Using Ethernet Loopback



As shown in the example in the figure above, traffic is looped back into the network and back to the test-set. The test-set can look for any anomalies such as frame loss or out-of-sequence frames. The loopback eliminates the need to connect a test-set in the field or at the customer premise to verify round-trip service.

Only Port Facility loopbacks are available. The following loopback functions are available:

- Facility Port Loopback
- Facility Port Timed Loopback

When using eVision, to remove a loopback, click on the drop-down list for Loopback Configuration and select "None", then click on "OK".

Port Facility Loopback

Port loopbacks consists of Facility loopbacks, which may be applied in a constant or timed manner. Placing a port in facility loopback mode connects all traffic frames received from the port to the associated transmitter (see Figure 26 on p. 57).

Loopbacks will loop back all traffic frames (including EFM-OAM messages), resulting in a disruption of service. Selecting the timed loopback option can minimize the amount of time service is disrupted while allowing a specified duration

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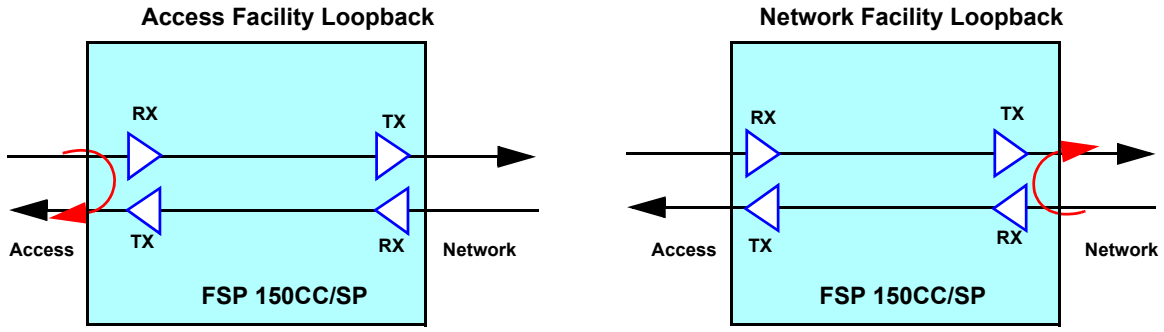
of testing. Port loopbacks ignore any traffic shaping and allow testing at the full port bandwidth.

Figure 26: Facility Loopback (without Swap SA/DA)



All traffic is looped back, including EFM-OAM messages

A simple facility loopback is sufficient for back-to-back FSP 150CC and/or FSP150SP configurations with no Layer 2 cloud between them. However, if a Layer 2 cloud does exist between each unit, traffic will not reach its intended destination. Within each Ethernet frame is a Media Access Control (MAC) address from which the frames are sent (Source Address) and the MAC address of the intended recipient of those frames (Destination Address). A Layer 2 cloud looks at the Destination Address to determine where to send the frames, and if the Destination Address is the same address from where the frames are received, the Layer 2 cloud will discard the frames.

Selecting the Swap SA/DA [Swapping the Source Address (SA) with the Destination Address (DA)] option during the loopback directs the unit to look up the MAC address of frames being received and swap out the Source Address with the Destination Address, allowing the Layer 2 cloud to forward the frames. Only one Swap SA/DA loopback may be performed per system. Once a Swap SA/DA loopback has been operated, a second Swap SA/DA loopback may not be performed on another entity.

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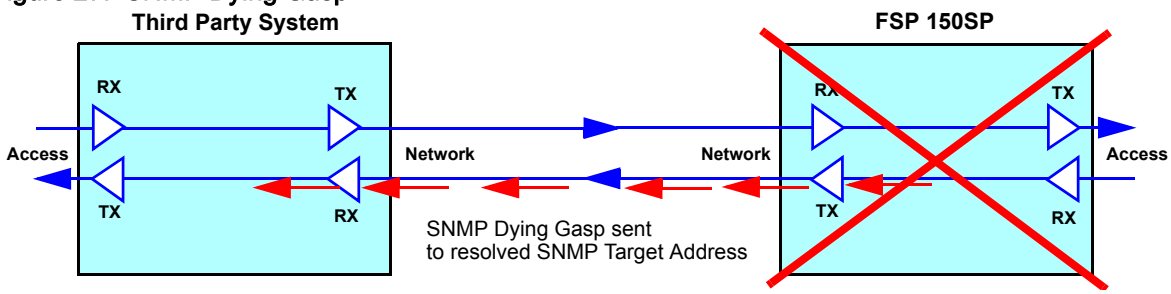
SNMP Dying Gasp

Unfortunately, the FSP 150SP can not process EFM-OAM Dying Gasp messages. The SNMP Dying Gasp feature may be used to enable peers to receive power failure notification as an SNMP trap. When SNMP Dying Gasp is enabled, Ethernet frame particulars such as Virtual Local Area Network (VLAN) and source MAC address are obtained from each interface's provisioned MAC- or VLAN-based management tunnel, and a Dying Gasp message is prepared for transmission to the first reachable SNMP target address, should a power failure occur. See the following figure for details.

Figure 27: SNMP Dying Gasp



Note that SNMP Dying Gasp, which is intended to supplant EFM-OAM Dying Gasp, only functions on traffic carrying ports (i.e., not the Management Local Area Network [LAN] port).

To set up the SNMP Dying Gasp feature, first create the appropriate Ethernet encapsulated VLAN-based management tunnel (the SNMP Dying Gasp feature only applies to Network and Access interfaces and are not applicable to the Management LAN or Serial Port). Then configure SNMP Target addresses on the FSP 150SP. Then enable SNMP Dying Gasp at the system level. Once an SNMP target address is configured and resolved, the SNMP Trap Dying Gasp Interface displays, indicating that the SNMP Dying Gasp feature is operational.

Resolving Target Addresses

The list of SNMP target addresses, as displayed, is polled every 5 minutes to resolve target addresses and verify reachability. It may take up to 10 minutes for a target address to be resolved. Upon reboot, a resolved SNMP target address is not displayed until a second 5 minute cycle has completed. Outside of a reboot, changes are reflected after each 5 minute poll cycle.

Resolving target addresses entails using trace route to determine the appropriate interface. It does not guarantee that the target address can be reached over that interface. Reachability uses ping (ICMP Echo) in an attempt to reach the target address. If the Ping fails, an "SNMP Dying Gasp Trap Host Unreachable Via Ping" alarm is raised. Note that reaching the IP address does not equate to an SNMP trap receiver running at that IP address. It is also possible that the ping could fail (e.g., be filtered by the network even though an SNMP trap would get through).

If an SNMP target address is unresolved, the SNMP Dying Gasp trap cannot be transmitted for that SNMP target address. Each interface may have one target address resolved for it. This means that a device that has two management tun-

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nels, with a resolved target address on each tunnel, will send out two SNMP Dying Gasp traps - one for each interface.

The first target address per interface that is resolved is considered as the “resolved” one for that interface. Other target addresses that would be reachable on that same interface are listed as unresolved.

Management Overview

The following describes the general management communications architecture and the management features supported in the FSP 150SP.

The FSP 150SP supports the following management interface connectors:

- Local Area Network (MGMT LAN) port (10/100 BaseT with RJ45 connector) for connection to a management Data Communications Network (DCN) or a local Personal Computer (PC).
- Serial Port (RS232 with RJ45 connector) to enable access to the Command Line Interface (CLI) from a local PC.
- VLAN based management tunnels. The FSP 150SP supports one management tunnel on each Network and Access Port.
- 3G Modem support via the front panel USB port.

Management Interfaces

Management interfaces consist of a eVision Web Browser Management Tool interface, a Command Line Interface and a Simple Network Management Protocol interface.

Command Line Interface

This document assumes the use of eVision for configuring and monitoring the FSP 150SP. However, a CLI is also available. The CLI command structure provides a text-based system for local configuration and management of FSP 150SP functions. For further information regarding the CLI and the command structure refer to the *Command Line Interface Reference Guide*.

Simple Network Management Protocol (SNMP)

The FSP 150SP provides seamless integration between SNMP and EFM environments to ensure seamless network level views via the FSP 150 enterprise Management Information Base (MIB). For further information regarding management via SNMP refer to the *SNMP Reference Guide*.

eVision Web Browser Management Tool

The FSP 150SP supports an eVision Web Browser Management Tool to provide a web based Graphical User Interface (GUI) for OAM functions. For further details on the eVision Web Browser Management Tool, refer to Chapter 2, “eVision Web Browser Management Tool” on p. 125.

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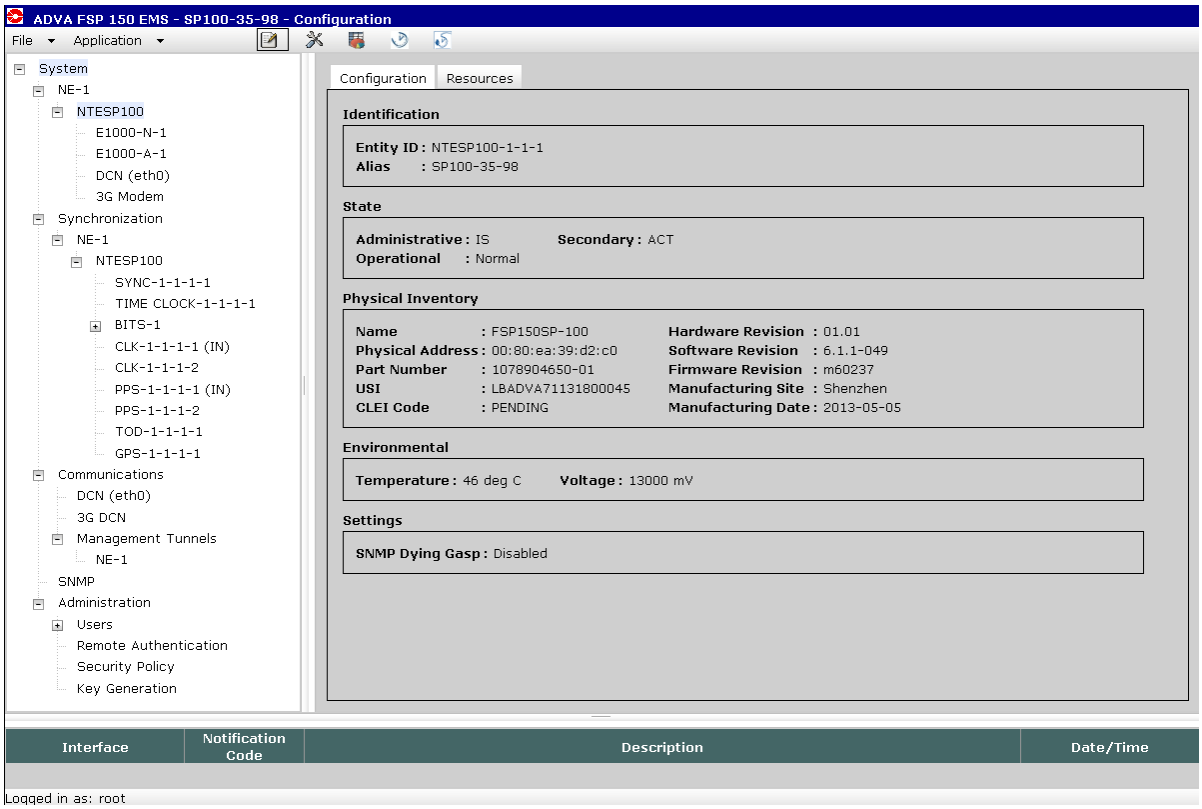
Figure 28: eVision Web Browser Management Tool



Management Features

User Management and Security

Security features include: user access security levels, Secure Sockets Layer (SSL) support for security of Secure Hypertext Transfer Protocol (HTTPS), Secure Shell (SSH) management protocols, RADIUS support, SNMP support, post login security banner, and Access Control List (ACL) management.

Web access to the onboard Element Manager is via HTTP or HTTPS. Telnet, SSH, HTTP, HTTPS, FTP, SFTP and SCP protocols may be enabled or disabled individually. Serial port access may also be disabled. The serial port automatically logs the user off on disconnect (provisionable).

Local User Profile Management

Up to 10 local user accounts are supported. A login inactivity time-out security feature provides a provisionable login time-out for each user ID regardless of access type. Four privilege levels are supported: Superuser, Provisioning, Maintenance and Retrieve. (See“User Authorization Privilege Levels” on p. 436)

Three preconfigured user accounts are provided as default: “root” (Superuser level), “netadmin” (Provisioning level), and “user” (Maintenance level). Default

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passwords for preconfigured user accounts is “ChgMeNOW.” Default login time-out is 15 minutes for each preconfigured user account.

A user account is locked for a period of 5 minutes after 3 unsuccessful login attempts (not applicable when RADIUS authentication is used). The number of unsuccessful login attempts are displayed in the user profile. The lockout period is not configurable.

SNMP User Management

SNMP MD5/SHA1 authentication protocols and AES/DES privilege protocols are supported.

Four preconfigured SNMP user accounts are provided as default: “ADMIN,” “MONITOR”, “OPERATOR” and “PROVISION”.

ACL Management

The system maintains an optional Access Control List (ACL) to restrict the IP addresses from which management connections are accepted. The ACL allows the operator to add up to 10 sub-networks or individual IP addresses to the ACL list. When the ACL is active, management of the system is restricted only to those valid IP addresses contained in the ACL.

Security Banner

The security banner feature allows an operator to define a custom security banner which is displayed whenever a user logs onto the system. This banner is displayed on CLI and web browser logins. The system is shipped with a default security banner.

RADIUS or TACACS+

Up to three RADIUS or TACACS+ servers may be configured for remote authentication. Both support accounting.

Provisioning

The FSP 150SP provides provisioning options for the various NE functions. The following provides a brief overview of provisioning options supported by the FSP 150SP. For detailed provisioning information, see “Operations Provisioning” on p. 153 and the *FSP 150SP-100 Technical Descriptions* document.

Communications Provisioning

The FSP 150SP provides facilities to set up a management communication configuration for a particular site or specific network configuration and supports several management configurations and options.

Typical deployment scenarios are in common IP network configurations and within an IP environment the FSP 150SP can be connected in many different ways, e.g.:

- connected to a LAN through direct connections, a router, or an Ethernet switch

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- static routes can be created to enable connections between a workstation and an FSP 150SP
- different IP functions can be used to achieve specific network goals, e.g., Address Resolution Protocol (ARP) enables one LAN-connected FSP 150SP to serve as a gateway for other equipment that is not connected to the LAN

Operations Provisioning

Provisioning System Options

Facilities are provided to provision system options, including:

- common system options, such as:
  - system identity
  - IP connectivity
  - time
  - access
  - SNMP traps
- information logs, including Security, Alarm, Audit and System Logs
- system security, such as the configuration of users, Access Control List (ACL) and the login security banner (see “Management Features” on p. 60)
- the Network Time Protocol (NTP)

Provisioning Network Elements

Facilities are provided to provision NEs, including the following:

- a Network Element Identity
- Configuring Network/Access Interfaces, including configuring Port Services

Provisioning Secure Access

Facilities are provided to ensure that access to the FSP 150SP management system is secure. This could entail configuring:

- SNMP details
- Users, including:
  - Adding/Editing/Deleting Users
  - Editing Passwords
  - Editing GUI Login Time-outs
- Remote Authentication

Provisioning Alarms

Facilities are provided to modify alarm notification codes for given alarm condition types, displayed in the Alarms Pane. The options available for notification codes are: Critical, Major, Minor, Not Alarmed or Not Reported. For further information on Alarm Monitoring see “Alarm Generation and Monitoring” on p. 63.

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Provisioning Performance Monitoring

Facilities are provided to edit PM threshold levels and initialize PM registers as a precursor to monitoring performance.

Alarm Generation and Monitoring

Alarm status is displayed in the Alarms Pane located at the bottom of the eVision screen. This provides constant visibility and access to current alarms, enabling continuous alarm monitoring no matter what application is currently selected.

In the Alarms Pane, all alarms are color coded by severity: red (Critical), orange (Major) and yellow (Minor).

For further information on the Alarms Pane, see Chapter 2, "eVision Web Browser Management Tool" on p. 125.

SP-100 Hardware Description

The SP-100 1U Chassis is a modular chassis-based system that comprises the following main components:

- **One Network interface** that operates in optical mode (100BaseFX or 1000BaseX) or Copper SFP via Small Form factor Pluggable (SFP) or electrical mode (100/1000BaseT) via RJ45 connector.
- **One Access interface,** configured as either electrical (10/100/1000BaseT) via RJ45 connector or optical (100BaseFX or 1000BaseX) or Copper SFP via an SFP transceiver.
- **3G Modem Input** connector (labeled USB) a front mounted USB connector
- **T1/E1 External Clock Input** connector (labeled BITS IN) and T1/E1 External Clock Output connector (labeled BITS OUT) are both front mounted RJ48c connectors
- **Local Management LAN Port** (labeled MGMT LAN) - front mounted RJ-45 connector
- **Local Serial Port** (labeled RS-232) - front mounted RJ-45 connector
- **Time of Day Input/Output** connector (labeled ToD) - front mounted RJ-45 RS-422 input / output capable
- **Pulse Per Second Input** connector (labeled PPS IN) - front mounted SMB - TTL (50 ohm impedance)
- **Pulse Per Second Input/Output** connector (labeled PPS) - front mounted SMB - TTL (50 ohm impedance)
- **External (10MHz) Frequency Reference Input** (labeled CLK IN) - front mounted SMB
- **External (10MHz) Frequency Reference Input/Output** (labeled CLK) - front mounted SMB
- **GPS Input** connector - front mounted SMA - TTL (50 ohm impedance)

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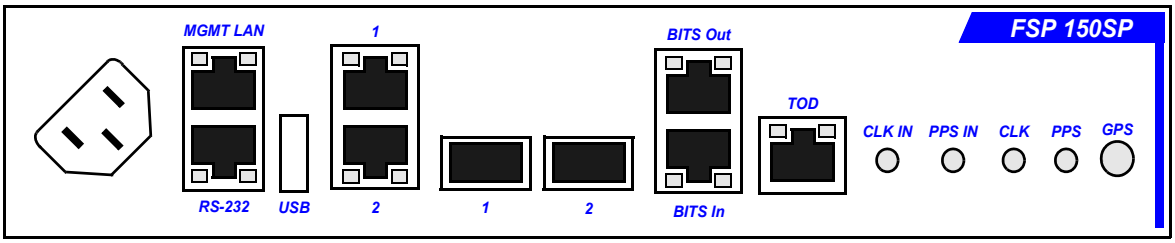
- Rack Mounting Brackets (ordered separately)
- One (non-redundant) Power Supply Unit (PSU)

Figure 29: SP-100 1U Chassis



Single fiber (bi-directional) and dual fiber and copper Small Form factor Pluggable (SFP) transceivers are supported. ADVA Optical Networking strongly encourages the use of ADVA Optical Networking sourced SFPs. No support is provided for systems that use SFPs other than those sourced by ADVA Optical Networking. The SFP contains a software key that is checked by the SP-100 service module base unit prior to initialization. This check is performed to ensure that only ADVA Optical Networking approved SFP units are used. SFP units are individually qualified by ADVA Optical Networking to ensure the quality of the optical output and conformance to the MultiSource Agreement (MSA).

If the SFP transceiver and rate do not match the configured application, an SFP mismatch alarm is raised. The port is then configured to prevent traffic from passing. If the SFP cannot pass ADVA check criteria, but the SFP transceiver and rate do match the configured application, a “SFP is not qualified” standing condition is raised, and traffic is allowed. For more information on SFPs, see the *FSP 150SP-100 Technical Descriptions* document.

For information on connectors and LED descriptions, see “Connector and LED Descriptions” on p. 65. For details on connector pin assignments see “Connector Pin Assignments” on p. 118.

Chassis Dimensions

The dimensions of the chassis are:

- Width, without mounting brackets: 220 mm
- Height, 1U: 44 mm
- Depth, without International Electrotechnical Commission (IEC) and optical connectors: 212 mm. The depth allows the chassis to fit into a 300 mm (11.81 in) deep European Telecommunication Standardization Institute (ETSI) cabinet.

Cable Tie Support (Integral)

Cable handling for the SP-100 is provided by means of an integral Cable Tie Support. This is positioned at the top of the AC and DC PSU chassis and provides a means to tie down all cables as well as unit insertion and removal.

Mounting Brackets

The chassis may be positioned as a standalone unit or it may be rack mounted or wall mounted. Adaptation to rack mounting is possible by using mounting brackets, which may be ordered separately. One mounting kit is applicable to a variety of mounting environments (see the *FSP 150SP-100 Technical Descriptions* document):

- Wall mounting

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- standard 19-inch rack mounting
- 19-inch extended (recessed) mounting in order to ensure that optical fiber bend radius is maintained when installed in some cabinets with doors
- standard 23-inch rack mounting
- standard ETSI rack mounting
- ETSI extended (recessed) mounting in order to ensure that optical fiber bend radius is maintained when installed in some cabinets with doors

All brackets are designed to be screwed to the sides of the chassis and the screws supplied have ETSI compatible threads.

Power Supply

Power is supplied to the SP-100 by one non-redundant integral PSU module, with Alternating Current (AC) and Direct Current (DC) variants available.

In the event of a complete system power failure, the system maintains internal voltages for a period that is sufficient to allow a dying gasp alarm to be raised via the in-band management channels (SNMP trap or 802.3ah EFM “Dying Gasp” messages).

For more detailed specification information, see the *FSP 150SP-100 Technical Descriptions* document.

Connector and LED Descriptions

Refer to the following for SP-100 connectors and LED descriptions when performing the following procedures. They may be used as supporting technical information for troubleshooting faults as well as connector and LED location/identification.

Refer to “Alarm Attributes, Probable Cause and Trouble Clearing” on p. 399 for a description of the alarm condition, probable cause, and suggested trouble clearing procedures. To clear alarm conditions, it is suggested that you start by using the trouble clearing procedure in “Recommended Steps for Trouble Clearing” on p. 381, using the associated eVision alarm condition.

Front Panel Connector Descriptions

All interface connections except the power connectors are located at the SP-100 front panel. The front panel of the SP-100 is shown in Figure 30 on p. 66.

The following connectors are provided on the front panel of the SP-100:

- Network 1GbE optical port. The Network interface uses single or dual SFP optical transceivers (SMF or MMF) that support 1000 Base SX/LX/ZX, or Copper SFPs.
- Network electrical port uses an RJ-45 (100/1000BaseT copper) connector.
- Electrical: Client 10/100/1000BaseT copper connector LAN port (RJ-45)

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- Optical: Client 1GbE optical LAN port. The optical LAN interface uses an SFP optical transceiver (SMF or MMF) that supports (1000 BaseLX10 or 1000 BaseLH) or single fiber (1000 BaseBX10), or Copper SFPs.
- 3G Modem input port is a USB connector.
- T1/E1 External Clock Input connector (labeled BITS IN) and T1/E1 External Clock Output connector (labeled BITS OUT) are both front mounted RJ-48c connectors (balanced 120 Ohm impedance)
- 10/100 Base-T Management LAN port (RJ-45)
- RS-232 Serial Console (maintenance) port (RJ-45)
- One (non-redundant) Power Supply Unit (PSU)
- GPS Input connector - front mounted SMA - TTL (50 ohm impedance)
- Time of Day input connector (labeled ToD) - front mounted RJ-45 RS-422 input / output capable
- Pulse Per Second input (labeled PPS IN) and a Pulse Per Second input/output connector (labeled PPS) - both are front mounted SMB - TTL (50 ohm impedance)
- External (10MHz) Frequency Reference input (labeled CLK IN) and an External (10MHz) Frequency Reference input/output (labeled CLK) - both are front mounted SMB

Figure 30: Front Panel Connectors and LEDs

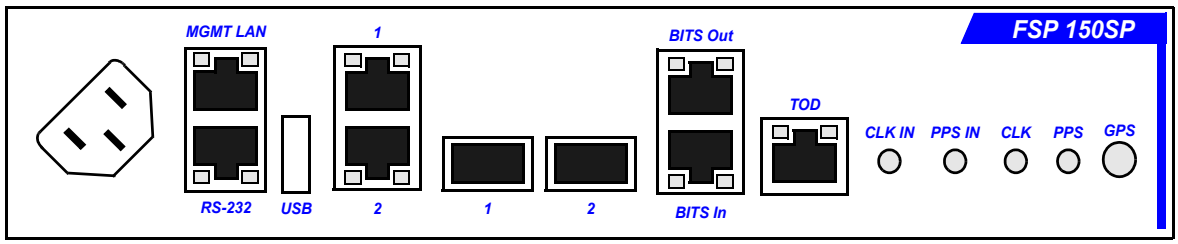

Table 1: Front Panel Connectors (Left to Right)

Section	Connectors	Description
PSU	AC power	AC power connector on AC power supply unit
	DC power	24 VDC or -48 VDC power connector on DC power supply unit
Management	RS-232	RJ-45 RS-232 Serial Console (maintenance) port
	MGMT LAN	RJ-45 10/100 BaseT Management LAN port supports automatic Medium-Dependent Interface Crossover (MDIX) capabilities
Synchronization	USB	USB port for 3G Modem connection

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Table 1: Front Panel Connectors (Left to Right) (Continued)

Section	Connectors	Description
Access	Electrical	RJ-45 Client 10/100/1000 BaseT Copper LAN port
	Optical	SFP optics Access port
Network	Optical	SFP optics Network port
	Electrical	RJ-45 Network 10/100/1000 BaseT Copper WAN port
Synchronization	BITS IN and BITS OUT	T1/E1 External Clock Input and Output, RJ-48c connectors (balanced 120 Ohm impedance)
	TOD	Time Of Day, RJ-48c connector
	CLK IN	Clock (10MHz) connector (input only)
	CLK	Clock (10MHz) connector (provisionable for input or output)
Synchronization	PPS IN	Pulse Per Second connector (input only)
	PPS	Pulse Per Second connector (provisionable for input or output)
	GPS	GPS Antenna connector

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System LEDs

The names and functions of each general system LED are described in the following table.

Table 2: System LEDs

LED Name	Color	Definition
STA	Off	No Power detected
	Green	Normal operation
	Flashing-Green	Equipment Initializing. The card is out of the boot loader and into the kernel. Software image validation is taking place and boot kernel, system kernel, system initialization, and system apps are all being started.
	Yellow	Equipment initializing. After power rails are within tolerance, the hardware sets this LED to solid yellow and it stays yellow while the processor is initializing.
	Flashing Yellow	Equipment initializing. • The card is in the boot loader stage and the image is in the process of being validated and loaded. • It also can indicate that software download or database backup/restore operations are in progress.
	Red	• Equipment Failure. Also, during boot-up, the Status LED is momentarily lit Red until all card power rails are up and within tolerance. • Equipment doesn't match provisioning.

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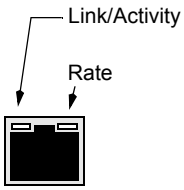
Local Management Port LEDs

The names and functions of each local management LAN port LED are described in the following table.

Table 3: Local Management LAN Port LEDs

Connector	LED	Color	Definition
RJ-45 (LAN) 	Link/ Activity	Off	No link
		Green	Link
		Flashing-Green	Activity
	Rate	Off	No link
		Yellow	10 Mbps operation
		Green	100 Mbps operation

Ethernet Access Port Client Ethernet Facility LEDs

Associated with the electrical Client Ethernet port is a facility LED and associated with the optical Client Ethernet port is a facility LED which are defined in the following table.

Table 4: Access Port Ethernet Facility LEDs

LED Name	Color	Definition
Ethernet Electrical Access Port Facilities	Off	Unassigned
	Green	Assigned and no defects
	Yellow	• Duplex Mismatch • Link Control Protocol (LCP) Fail • EFM RLS (Remote Link Status) • EFM RCE (Remote Critical Event) • EFM Fail (EFM Discovery Fail) • Remote Failure Indication (RFI)
	Flashing-Yellow	Facility in loopback
	Red	• Dying Gasp • Link Deactivated • Link Down (Unisolated, Cable Removed, Cable Fault, Auto Negotiation Fault) • Receive Jabber

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Table 4: Access Port Ethernet Facility LEDs (Continued)

LED Name	Color	Definition
Ethernet Optical Access Port Facilities	Off	Unassigned
	Green	Assigned and no defects
	Yellow	• Link Control Protocol (LCP) Fail • EFM RLS (Remote Link Status) • EFM RCE (Remote Critical Event) • Remote Failure Indication (RFI) • SFP Mismatch
	Flashing-Yellow	Facility in loopback
	Red	• Dying Gasp • Receive Jabber • SFP Removed • SFP Tx Fault

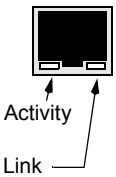
Associated with the Optical Access Ethernet port are two LEDs (Link and Rate) as defined in the following table.

Table 5: Access Optical Ethernet Link and Rate LEDs

Connector	LED	Color	Definition
SFP	Rate (RT)	Off	Unassigned
		Yellow	100M Operation
		Green	1000M Operation
	Link/ Activity (LK)	Off	• Unassigned • SFP not present • Link Down
		Green	Working (Link detected)
		Flashing Green	Traffic (TX or RX)

The RJ-45 electrical Access Ethernet port has two LEDs associated with the connector. The definitions of the LEDs are shown in the following table.

Table 6: Access Port Electrical RJ-45 Connector LED Definitions

Connector	LED	Color	Definition
RJ-45 	Activity	Off	• Unassigned • No Traffic
		Flashing Green	Traffic (TX or RX)
	Link	Off	• Unassigned • Link Down
		Green	Link Detected

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Network Ethernet Port LEDs

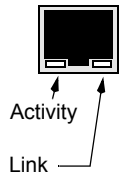
Associated with the Network optical Ethernet port are two LEDs (Link and Rate) as defined in the following table.

Table 7: Network Optical Ethernet Link and Rate LEDs

Connector	LED	Color	Definition
SFP	Rate (RT)	Off	Unassigned (only applies to Port 2)
		Yellow	100M Operation
		Green	1000M Operation
	Link/ Activity (LK)	Off	• Unassigned (only applies to Port 2) • SFP not present • Link Down
		Green	Working (Link detected)
		Flashing Green	Traffic (TX or RX)

The Network Port RJ-45 electrical Ethernet port has two LEDs associated with the connector. The definitions of the LEDs are shown in the following table.

Table 8: Network Port Electrical RJ-45 Connector LED Definitions

Connector	LED	Color	Definition
RJ-45 	Activity	Off	• Unassigned • No Traffic
		Flashing Green	Traffic (TX or RX)
	Link	Off	• Unassigned • Link Down
		Green	Link Detected

Also associated with the Network optical Ethernet port are two LEDs, Network (NET) and Active/Standby (ACT), as defined in the following table.

Table 9: Network Optical Ethernet Facility and Active LEDs

LED	Color	Definition
Network Facility (NET)	Off	Unassigned (only applies to Port 2)
	Yellow	Remote Fault / Degraded Facility
	Flashing-Yellow	Facility in loopback
	Green	Operating
	Red	Link Fault
Active/ Standby (ACT)	Off	Not assigned to a protection group.
	Green	Active (the active path in a protection group)
	Yellow	Standby (a standby port providing redundancy for the Active port)

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Chapter 2

Physical Installation

Introduction

This Chapter deals with the physical installation of the SP-100 and the external cabling for power, management and traffic to and from the chassis. Additionally, this chapter includes links to technical information and procedures elsewhere in the document that are needed or helpful in successfully completing the installation process.

Physical Installation

This section provides the information required to successfully install an SP-100 system. Installation consists of:

- the physical installation of hardware, which includes:
  - preparing for installation
  - mounting the FSP 150SP
- connecting cables and powering up the equipment

Note

Only suitably qualified personnel may install FSP 150SP equipment.

It is recommended that personnel installing the FSP 150SP be trained and authorized by ADVA Optical Networking. The training necessary to install, operate and service the FSP 150SP includes the following as a minimum:

- background information on optical fiber communication systems
- safety information concerning the laser classification system and the hazard levels of the FSP 150SP
- guidance on the safe use of the FSP 150SP equipment.

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To successfully install and commission a FSP 150SP, the following sections and the steps must be followed in the order that they are given. Observe the following precautions when performing the installation tasks in this chapter.

CAUTION

Invisible Laser Radiation

(1) The FSP 150SP is a class 1 laser product when equipped with Small Form Factor Pluggable (SFP) modules, approved by ADVA Optical Networking.

(2) Do NOT stare into the beam of any optical (e.g., SFP) Interface or view directly with optical instruments.

(3) SFP Interfaces contain laser emitters on the front of the unit operating at a wavelength of 850/1310/1550/1610nm (and various ranges in between), Class 1 AEL.

WARNING

Do not touch the backplane under any circumstances when power is applied.

This product contains Electro-Static Sensitive Devices.

Appropriate anti-static handling precautions should be followed (i.e., IEC 61340-5-1:1998).

Preparing for Installation

Before physically installing the FSP 150SP the following tasks must be completed:

- Verify site readiness. See Verifying Site Readiness.
- Ensure that all cables, tools and equipment required for installation, are readily available. See “Requirements” on p. 76.
- Unpack and inspect the FSP 150SP equipment. See “Unpack and Inspect the FSP 150SP Equipment” on p. 80.

Verifying Site Readiness

Before installation ensure that the site is suitable.

Check the items listed below. If any check fails, rectify the problem before continuing.

If the FSP 150SP is to be mounted in a rack:

- Is a rack available and is there sufficient space in it?

Height	44 mm
Width	220 mm (without brackets)
Depth	212 mm

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The chassis is designed for passive (fanless) air cooling. The number of units that can be stacked are determined by the environment the unit will be installed in, not the unit type that will be installed. The following are requirements for maintaining internal temperatures within design limits:

Note

When units are installed in an I-Temp (Industrial) environment, units can be stacked 1 high and must be mounted as a single unit only. Dual unit mounting in an I-Temp environment should not be implemented. When units are installed in a C-Temp (Commercial) environment, units can be stacked 4 high.

If it is necessary to install a single SP-100 unit in an I-Temp environment or 4 rows of SP-100s in a C-Temp environment above other heat producing components, it is recommended that a heat deflector is installed below the SP-100(s). If it is necessary to install heat sensitive equipment above a single SP-100 unit in an I-Temp environment or 4 rows of SP-100s in a C-Temp environment, it is recommended that a heat deflector is installed above the SP-100(s).

- Has the rack been correctly leveled and secured to the floor?
- If appropriate, has the rack been grounded by a Safety Ground Cable according to local office policy?
- Are the appropriate rack / wall mounting kit(s) at hand?

If the FSP 150SP is to be mounted on a wall:

- Is there sufficient clearance on either side of the chassis so that the air vents are not obscured when the chassis is positioned?
- Is there sufficient clearance between the unit along the wall to perform the necessary work?

If the FSP 150SP is to be provisioned locally, is AC power available for a maintenance PC?

Is AC or –48 VDC or 24VDC power available for the FSP 150SP?

Are the following AC and/or DC power input specifications met?

AC Voltage	120 / 240 VAC nominal, 50-60Hz nominal, external fuse should be rated at 4A
–48 VDC Voltage (Central Office Type)	–48 / –60 VDC nominal, external fuse should be rated at 4A
+24 VDC Voltage (Mobile Backhaul)	+24 VDC nominal, external fuse should be rated at 4A
Max Power Consumption, DC/AC power	21W
Connectors	IEC-60320/C14 AC socket / DC input, Terminal block

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Are the following operating temperature specifications met?

Operating Temperature	-40C to +65C
Max Relative Humidity	Max. 95% (non-condensing)

Requirements

In order to install the FSP 150SP, several types of cables, tools, equipment and software applications are needed. The requirements are described in the following sections.

Cables

Ensure that the cable types under the following headings are readily available, as appropriate, for installation.

Power Cables

Alternating Current

Straight connection International Electrotechnical Commission (IEC) lead with Central European, UK, US plug. One is required for each AC power supply variant, with external fuse rated at 4A.

Direct Current

For connecting the FSP 150SP to a fuse panel use a Direct Current (DC) power cable (Power wires AWG 16) and 4A (minimum) slow blow fuses. DC power cables are not supplied with FSP 150SP equipment and must be ordered separately. See the *FSP 150SP-100 Technical Descriptions* document.

Frame Ground Cable

An optional Earth (Frame Ground) connection may be attached to the Earth terminal point, located at the rear of the unit. Each FSP 150SP unit is supplied with an Earth Terminal Kit and a 10 foot, 16 gauge grounding cable, terminated with a round connector at one end and a slotted connector at the other end. During installation, the ground cable is terminated at the rear of the unit at one end and terminated at a site designated frame mounting point or ground bar at the other end. A terminal tab is provided in the Earth Terminal Kit for optional push-on connection to the Earth terminal point.

Fiber-optic Cables

Use fiber-optic cables that support distances up to the maximum drive distance. Both single mode (9/125µm) and multi-mode (50/125µm and 62.5/125µm) are supported. (Note that the fiber type (SM/MM) must match the SFP module type.)

Do fiber optic cables have correct connectors?

Are the appropriate Small Form Factor Plugables (SFPs) identified and supplied for each applicable Network/Access interface? Refer to the “FSP 150 Ethernet Access Compatibility Matrix” document which contains up-to-date information on which SFPs are certified for each product. This document may be obtained through ADVA Technical Support or via the product support site on www.adva-optical.com.

Is there fiber for each applicable Network/Access interface?

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Copper Cables

Observe the following precaution for copper cables:

WARNING

The intra-building port(s) of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the Outside Plant (OSP) or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

WARNING

This product is classified as Type2 equipment and requires the use of shielded cable which is terminated at both ends (per GR1089 R4-18), on the following interfaces:

GPS, PPS, PPS IN, CLK, CLK IN, TOD, Bits In, Bits Out

Obtain and verify the following for copper cables:

Do all LAN port copper/electrical cables have RJ45 connectors?

Access Port Copper Connections

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-45 connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ-45 connectors may be used. The cable should be no longer than 100m and should be compliant with the Institute of Electrical and Electronics Engineers (IEEE) 802.3:1998 Ethernet standard. See “LAN Connector Pin Assignments” on p. 120.

Local Serial Console Port Connection

For provisioning the FSP 150SP via the serial management port:

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-45 connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ-45 connectors may be used. An adapter to the PC serial port (F, DB9) is required. See “Serial Console Port Connector Pin Assignments” on p. 121. (The Serial Console Adapter is shipped with the unit in the Accessory Kit, and may also be ordered separately; Part Number 1036904035.)

Local Management LAN Port Connection

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-45 connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ45 connectors may be used for connection to a DCN port. See “LAN Connector Pin Assignments” on p. 120.

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3G DCN Port Connection

Insert the 3G modem into the USB port. Available ADVA Optical Networking qualified 3G modems are as below:

- ZTEMT 119
- HW E1750

If cable extension is required, an ADVA Optical Networking qualified cable must be used.

BITS IN and BITS OUT Port Connections

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-48c connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ-48c connectors may be used for connection to BITS IN and BITS OUT ports. See “RJ-48c BITS Connector Pin Description and Assignments” on p. 122.

Time of Day (TOD) Port Connection

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-45 connectors is required for all metallic interface connections. See “Time of Day (TOD) Connector Pin Assignments” on p. 123.

10 MHz Reference Clock (CLK In, CLK) Port Connection

A cable terminated with mini-coax connector is required for connection to the 10MHz ports.

Pulse Per Second (PPS IN, PPS) Port Connection

A cable terminated with mini-coax connector is required for connection to the PPS ports.

Global Positioning System (GPS) Port Connection

A cable terminated with mini-coax connector is required for connection to the GPS port.

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Tools

The tools described below are required for installation.

Screwdrivers

The following screwdrivers may be required during installation:

- a No.1 Pozi or Phillips screwdriver to attach DC power cables
- a No.2 Pozi or Phillips screwdriver to attach chassis rack mounting brackets

ESD Protection

As the FSP 150SP contains electro-static sensitive devices, a grounded anti-static wrist or heel strap is required when handling the unit to reduce electro-static charges.

Compressed Air

Canned, dry, oil-free compressed air for removing dust or debris is required.

DC Power Cabling

For connecting DC powered FSP 150SP power supply units, you need the following items:

- Screwdriver
- Wire wrap tool
- Wire cutters
- Wire strippers
- Volt meter
- Fuse panel
- Other power related tools and supplies as required by local practices

Optical Equipment

The following optical equipment is required during installation:

- signal/protocol generator or Bit Error Rate Tester (BERT)
- variable or fixed attenuators in the range 3dB to 11dB or fiber spools providing equivalent attenuation
- an optical power meter calibrated for the required wavelength(s)
- Optical fiber cleaning materials

Personal Computer

When provisioning the FSP 150SP, a personal computer or laptop with telnet or SSH is required, with an RJ-45 Ethernet patch cable (cross-over or straight-through) and an RJ-45 to F, DB9 adapter (The Serial Console Adapter is shipped with the unit in the Accessory Kit, and may also be ordered separately; Part Number 1036904035.)

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Use a PC or Laptop running the OS MS Windows version XP, Vista or Windows 7 with:

- an unused serial RS-232 port
- a VT100 or ANSI compatible terminal emulation program (e.g., Tera Term Pro Web 3.1.3) loaded.

Unpack and Inspect the FSP 150SP Equipment

Depending on the order, a FSP 150SP shipment may consist of a number of equipment packs.

This product contains electro-static sensitive devices.

Appropriate anti-static handling precautions should be followed (i.e., IEC 61340-5-1:1998).

Note

Further details on equipment packs and part numbers are provided in the *FSP 150SP-100 Technical Descriptions* document.

Verify the contents of the shipment and the condition of the equipment as soon as it arrives. Use the following procedure for unpacking and inspecting the equipment.

Procedure

Step 1 Remove the FSP 150SP equipment from its shipping cartons.

Step 2 Compare the equipment in each carton with the equipment lists in this section. If there are discrepancies, notify ADVA Optical Networking immediately with details of the discrepancies (see "Obtaining Technical Assistance" on p. 26).

Step 3 Check all components. If shipping damage is discovered notify ADVA Optical Networking immediately (see "Obtaining Technical Assistance" on p. 26). Please have the following information available:
- Part number of the equipment pack
- Serial and version number of the damaged unit
- Description of the damage
- How the damage may prevent successful installation

Step 4 If any FSP 150SP equipment is to be returned to ADVA Optical Networking, re-pack the equipment in the original carton. For details on returning FSP 150SP equipment refer to "Returning Equipment" on p. 81.

Step 5 Unless the equipment is to be installed immediately, put all equipment back in the packaging, otherwise proceed with the installation.

End of Procedure

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Returning Equipment

If you need to return equipment, use the following procedure.

This product contains electro-static sensitive devices.

Appropriate anti-static handling precautions should be followed (i.e., IEC 61340-5-1:1998).

Note

If returning equipment to ADVA Optical Networking for repair or replacement, use the original packaging material for optimum equipment protection.

Procedure

Step 1 Repack the FSP 150SP equipment in the original packaging for optimum equipment protection.

Step 2 Contact ADVA Optical Networking for assistance. See “Obtaining Technical Assistance” on p. 26 for contact details.

End of Procedure

Install the FSP 150SP

This section details the installation procedures for individual FSP 150SP Base Unit. A full description of the FSP 150SP components covered can be found in “SP-100 Overview” on p. 23. Component part numbers and technical specifications can be found in the *FSP 150SP-100 Technical Descriptions* document.

The chassis is designed for passive (fanless) air cooling. See following note.

Note

The chassis is designed for passive (fanless) air cooling. The number of units that can be stacked are determined by the environment the unit will be installed in, not the unit type that will be installed. The following are requirements for maintaining internal temperatures within design limits:

When units are installed in an I-Temp (Industrial) environment, units can be stacked 1 high and must be mounted as a single unit only. Dual unit mounting in an I-Temp environment should not be implemented. When units are installed in a C-Temp (Commercial) environment, units can be stacked 4 high.

If it is necessary to install a single SP-100 unit in an I-Temp environment or 4 rows of SP-100s in a C-Temp environment above other heat producing components, it is recommended that a heat deflector is installed below the SP-100(s). If it is necessary to install heat sensitive equipment above a single SP-100 unit in an I-Temp environment or 4 rows of SP-100s in a C-Temp environment, it is recommended that a heat deflector is installed above the SP-100(s).

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Before installing FSP 150SP, refer to “Preparing for Installation” on p. 74, for details on site verification, the tools and equipment required for installation and procedures for installing the FSP 150SP.

WARNING To avoid eye injury from debris, always wear safety glasses when working with canned compressed air.

This product contains electro-static sensitive devices.

Appropriate anti-static handling precautions should be followed (i.e., IEC 61340-5-1:1998).

Mounting Kits

Four rack mounting kits are available for mounting the SP-100:

- SP-100 Single Rack Mounting Brackets (part number 1013904010)
- SP-100 Dual Rack Mounting Brackets (part number 1013904011)
- SP-100 Extended Rack Mounting Brackets (part number 1013904012)
- SP-100 Wall Mounting Brackets (part number 1013904013)

For certain applications, multiple kits are required. See the *FSP 150SP-100 Technical Descriptions* document for kit components and refer to the following mounting options for details on which kits are required for your application.

Mounting Options

The chassis may be rack mounted, wall mounted or placed as a standalone unit. Use one of the following procedures to mount the FSP 150SP:

Table 10: SP-100 Mounting Procedures

Single SP-100	Dual SP-100	Mounting Type	Mounting Kit(s) Required	Procedure
X		19” Standard or Extended	1013904010	“Mounting a Single FSP SP-100 via a Standard or Extended 19” Configuration” on p. 84
X		23” Standard or Extended	1013904010 and 1013904012	“Mounting a Single SP-100 via a 23” Standard or Extended / ETSI Extended Configuration” on p. 85
X		ETSI Extended	1013904010 and 1013904012	
	X	19” Standard or Extended	1013904011	“Mounting Dual SP-100s via a 19” Standard or Extended Configuration” on p. 88
	X	23” Standard or Extended	1013904011 and 1013904012	“Mounting Dual SP-100 via a 23” Standard or Extended / ETSI Extended Configuration” on p. 90
	X	ETSI Extended	1013904011 and 1013904012	

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Table 10: SP-100 Mounting Procedures

Single SP-100	Dual SP-100	Mounting Type	Mounting Kit(s) Required	Procedure
X		Wall Mounted	1013904013	“Mounting the SP-100 to a Wall” on p. 92
X		Cabinet or Desk	N/A	“Installing a Standalone Chassis” on p. 94

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Mounting a Single FSP SP-100 via a Standard or Extended 19” Configuration

Prior to mounting the SP-100, please check the mounting package contents carefully. One mounting kit is required: The SP-100 Single Rack Mounting Brackets kit (part number 1013904010).

The following components will be used in this procedure:

- One 19” mounting bracket (short)
- One 19” mounting bracket (long)
- Four M3x5 CSK POZI screws
- Four 12-24 x 0.5 phillips screws - or - Four M6x20 screws and four M6 nuts

WARNING

(1) MECHANICAL LOADING. When mounting the equipment in a rack ensure that a hazardous condition is not created by uneven mechanical loading.

(2) Ensure that reliable grounding of the rack mounted equipment is maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit.

Use the following procedure to install a single SP-100 via a Standard or Extended 19” configuration.

Procedure

The steps for fitting the appropriate mounting brackets are as follows:

Step 1 Take the chassis out of its packaging and put it on an antistatic surface. If necessary, use canned compressed air to blow off any dust particles.

Step 2 Secure the 19” mounting bracket (short) and 19” mounting bracket (long) to the SP-100 using four M3X5 CSK POZI screws. If installing in a Standard configuration, set the brackets flush with the SP-100. If installing in an Extended configuration line up the rear set of bracket holes to the SP-100 so that the SP-100 is recessed from the front of the bracket. See Figure 31 on p. 85.

Step 3 Mount the SP-100 to the 19” rack with four 12-24 x 0.5 phillips screws or four M6x20 screws and four M6 nuts.

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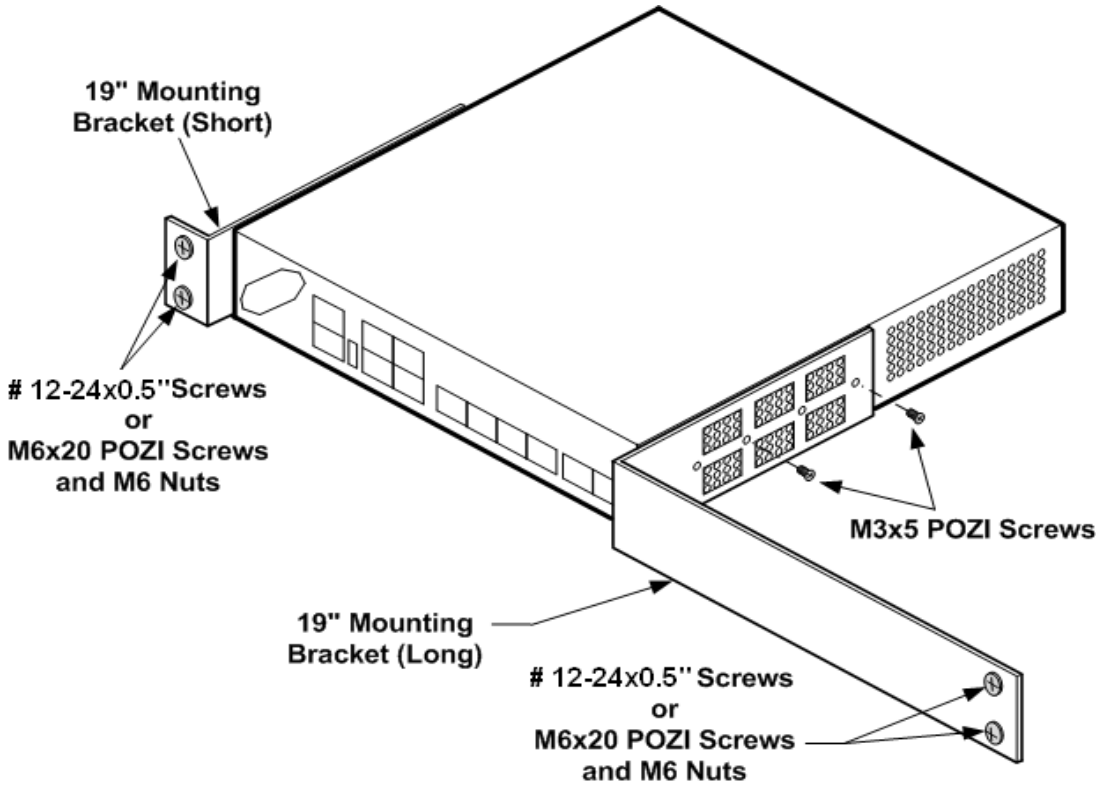
Figure 31: Mounting a Single SP-100 via EXT 19" Configuration



End of Procedure

Mounting a Single SP-100 via a 23" Standard or Extended / ETSI Extended Configuration

Prior to mounting the SP-100, please check the mounting package contents carefully. Two mounting kits are required:

- SP-100 19" Single Rack Mounting Brackets kit (part number 1013904010)
- SP-100 Extended Rack Mounting Brackets kit (part number 1013904012)

The following components will be used in this procedure:

- One 19" mounting bracket (short)
- One 19" mounting bracket (long)
- Four M3x5 CSK POZI screws
- Two adapter brackets (extender tabs): 1U 19" to 23" or 1U 19" to ETSI
- Four 10-32 x 0.375 screws
- Four 12-24 x 0.5 phillips screws - or - Four M6x20 screws and four M6 nuts

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WARNING

(1) MECHANICAL LOADING. When mounting the equipment in a rack ensure that a hazardous condition is not created by uneven mechanical loading.

(2) Ensure that reliable grounding of the rack mounted equipment is maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit.

Use the following procedure to install a single SP-100 via a Standard or Extended 23” / ETSI Extended configuration.

Procedure

The steps for fitting the appropriate mounting brackets are as follows:

Step 1 Take the chassis out of its packaging and put it on an antistatic surface. If necessary, use canned compressed air to blow off any dust particles.

Step 2 Secure the 19” mounting bracket (short) and 19” mounting bracket (long) to the SP-100 using four M3x5 CSK POZI screws.

For 23” rack installation: attach one 1U 19” to 23” extender bracket to each 19” mounting ear (short and long) using four 10-32 x 0.375 screws. For ETSI rack installation: attach one 1U 19” to ETSI extender bracket to each 19” mounting ear (short and long) using four 10-32 x 0.375 screws See Figure 32 on p. 87.

If installing in a Standard configuration, set the brackets flush with the SP-100. If installing in an Extended configuration, line up the rear set of bracket holes to the SP-100 so that the SP-100 is recessed from the front of the bracket.

Step 3 Mount the SP-100 to the 23” rack or ETSI rack with four 12-24 x 0.5 phillips screws or four M6x20 screws and four M6 nuts.

End of Procedure

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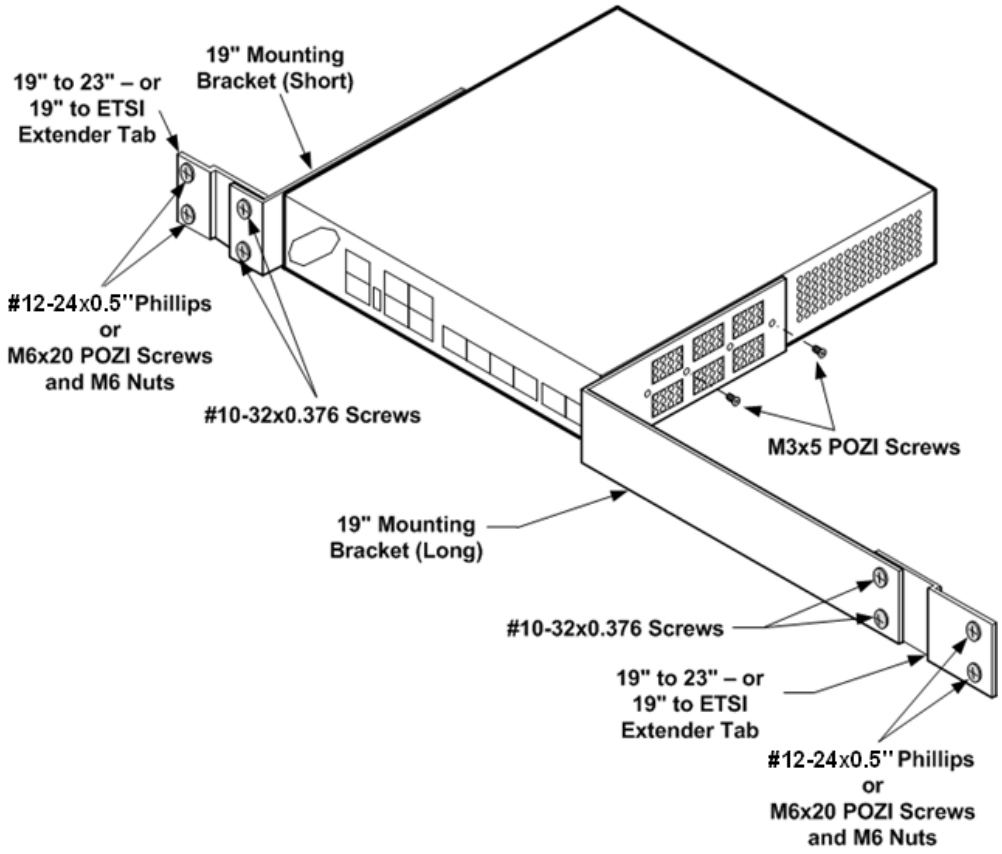
Figure 32: Mounting a Single SP-100 via EXT 23" / ETSI Extended Configuration



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Mounting Dual SP-100s via a 19” Standard or Extended Configuration

Prior to mounting the SP-100, please check the mounting package contents carefully. One mounting kit is required: the SP-100 Dual Rack Mounting Brackets Kit (part number 1013904011).

The following components will be used in this procedure:

- two 19” short rack mounting brackets
- two dual mounting brackets
- six M2x6 Phillips A2 screws
- eight M3x5 CSK POZI A2 screws
- Four 12-24 x 0.5 phillips screws - or - Four M6x20 POZI screws and four M6 nuts

WARNING

(1) MECHANICAL LOADING. When mounting the equipment in a rack ensure that a hazardous condition is not created by uneven mechanical loading.

(2) Ensure that reliable grounding of the rack mounted equipment is maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit.

Use the following procedure to install dual SP-100s via a Standard or Extended 19” configuration.

Procedure

The steps for fitting the appropriate mounting brackets are as follows:

Step 1 Take the chassis out of its packaging and put it on an antistatic surface. If necessary, use canned compressed air to blow off any dust particles.

Step 2 If necessary, determine which SP-100 will reside on the left and which will reside on the right. Install one of the dual mounting brackets to the right side of the left SP-100 using two M3x5 CSK POZI screws. Mount the other dual mounting bracket to the left side of the right SP-100 using two M3x5 CSK POZI screws. Ensure that the dual mounting brackets are “flipped” from one another (oriented so they will mate correctly when they are attached in the next step). See Figure 33 on p. 89.

Step 3 Secure the dual mounting brackets to each other using six M2x6 Phillips A2 screws (three on the top and three on the bottom). See Figure 33 on p. 89.

Step 4 Secure a 19” (short) mounting bracket to the left unit using two M3X5 CSK POZI screws and secure the remaining 19” (short) mounting bracket to the right unit using two M3x5 CSK POZI screws. See Figure 33 on p. 89.

If installing in a Standard configuration, set the brackets flush with the SP-100. If installing in an Extended configuration line up the rear set

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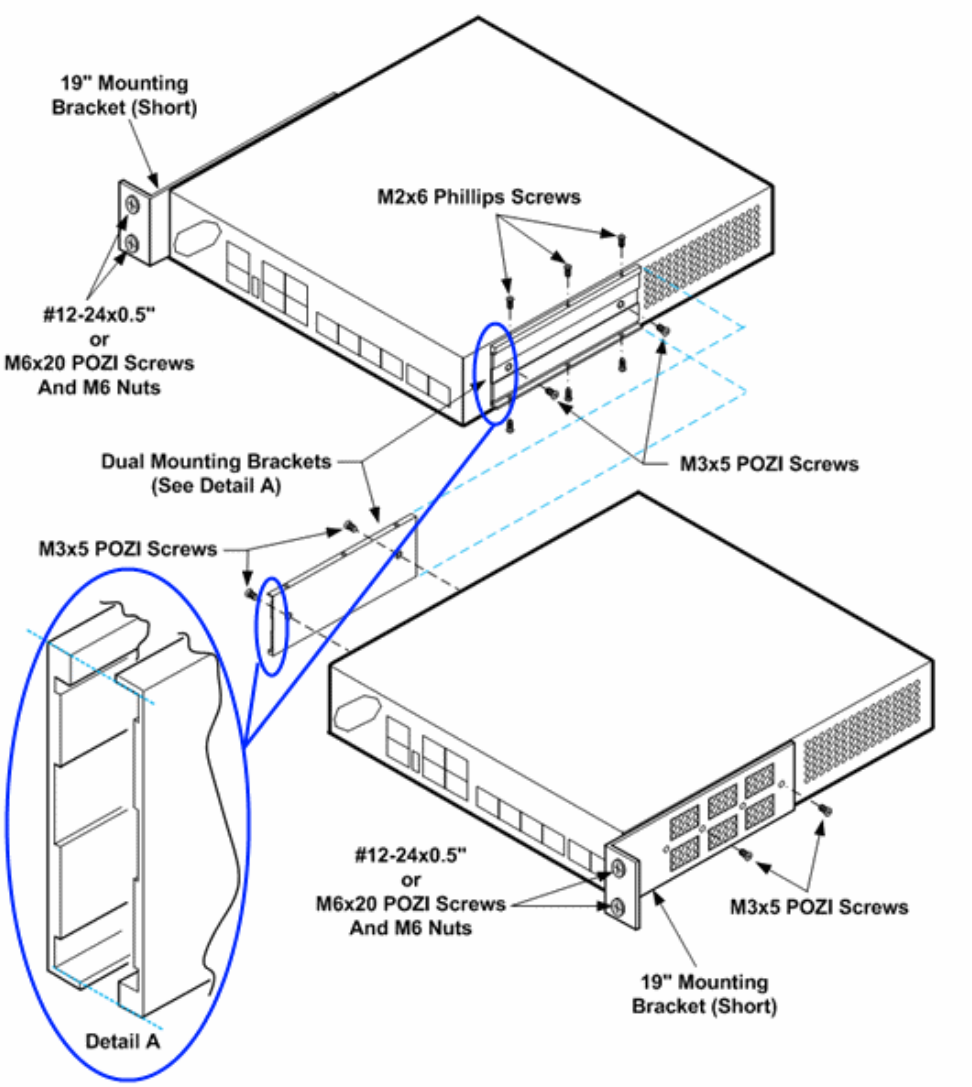
of bracket holes to the SP-100 so that the SP-100 is recessed from the front of the bracket.

Step 5 Mount the SP-100 to the 23” rack or ETSI rack with four 12-24 x 0.5 phillips screws or four M6x20 screws and four M6 nuts.

End of Procedure

Figure 33: Mounting Dual SP-100s via EXT 19” Configuration


19" Mounting Bracket (Short)
M2x6 Phillips Screws
#12-24x0.5" or M6x20 POZI Screws And M6 Nuts
Dual Mounting Brackets (See Detail A)
M3x5 POZI Screws
M3x5 POZI Screws
#12-24x0.5" or M6x20 POZI Screws And M6 Nuts
M3x5 POZI Screws
19" Mounting Bracket (Short)
Detail A

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Mounting Dual SP-100 via a 23” Standard or Extended / ETSI Extended Configuration

Prior to mounting the SP-100, please check the mounting package contents carefully. Two mounting kits are required:

- SP-100 Dual Rack Mounting Brackets Kit (part number 1013904011)
- SP-100 Extended Rack Mounting Brackets kit (part number 1013904012)

The following components will be used in this procedure:

- two 19” short rack mounting brackets
- two dual mounting brackets
- six M2x6 Phillips A2 screws
- eight M3x5 CSK POZI A2 screws
- Two adapter brackets (extender tabs): 1U 19” to 23” or 1U 19” to ETSI
- Four 10-32 x 0.375 screws
- Four 12-24 x 0.5 phillips screws - or - Four M6x20 POZI screws and four M6 nuts

WARNING (1) MECHANICAL LOADING. When mounting the equipment in a rack ensure that a hazardous condition is not created by uneven mechanical loading.

(2) Ensure that reliable grounding of the rack mounted equipment is maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit.

Use the following procedure to install dual SP-100s via a Standard or Extended 23” / ETSI Extended configuration.

Procedure

The steps for fitting the appropriate mounting brackets are as follows:

Step 1 Perform all the steps in the following procedure: “Mounting Dual SP-100s via a 19” Standard or Extended Configuration” on p. 88.

Step 2 Attach the extension brackets to each end unit:

For 23” rack installation: attach one 1U 19” to 23” extender bracket to each (left and right unit) 19” mounting ear using four 10-32 x 0.375 screws. For ETSI rack installation: attach one 1U 19” to ETSI extender bracket to each (left and right unit) 19” mounting ear using four 10-32 x 0.375 screws. See Figure 34 on p. 91.

If installing in a Standard configuration, set the brackets flush with the SP-100. If installing in an Extended configuration, line up the rear set of bracket holes to the SP-100 so that the SP-100 is recessed from the front of the bracket.

Step 3 Mount the dual-mated SP-100s to the 23” rack or ETSI rack with four 12-24 x 0.5 phillips screws or four M6x20 screws and four M6 nuts.

End of Procedure

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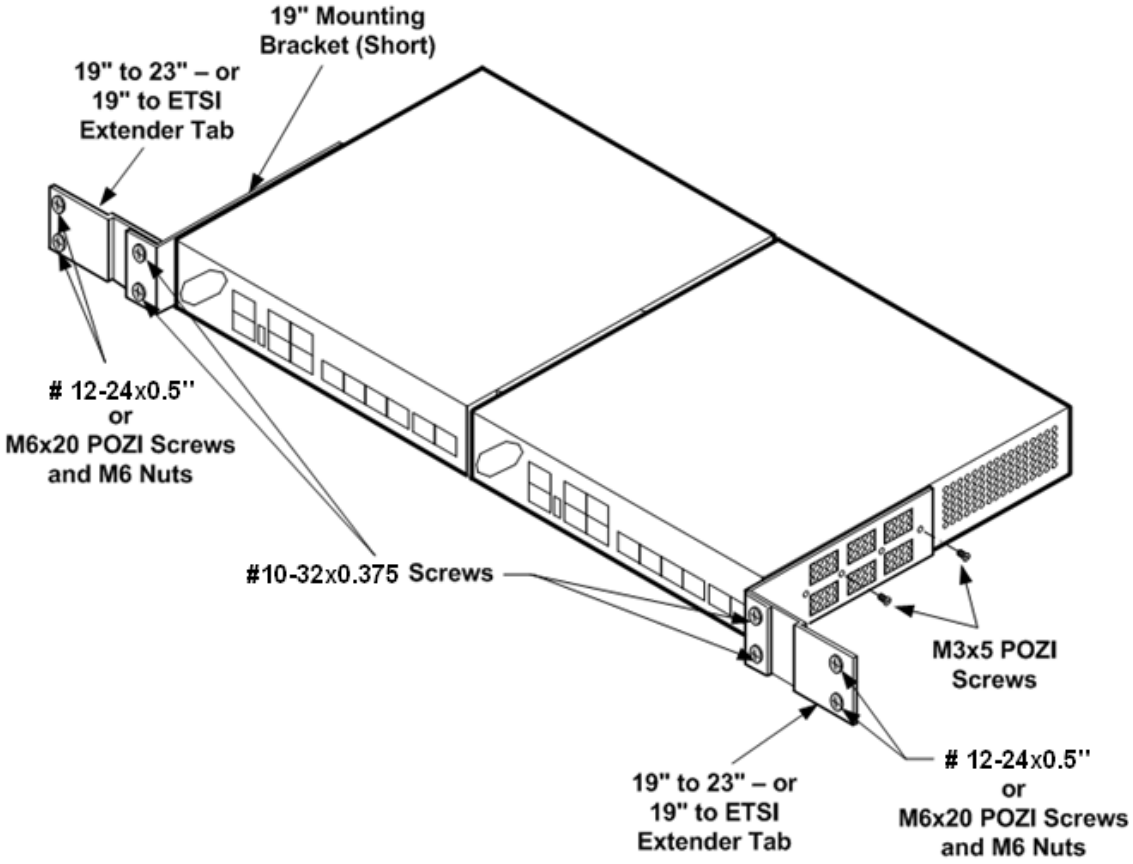
Figure 34: Mounting Dual SP-100s via EXT 23" / ETSI Configuration



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Mounting the SP-100 to a Wall

Use the following procedure to install a single chassis on a wall.

The single rack/wall mounting kit (part number 1013904013) supports wall mounting applications, and contains the following components:

- two wall mounting brackets
- four M3x5 CSK POZI A2 screws

Wall anchoring components are supplied by the installer, depending on the mounting surface.

Procedure

Step 1 Select a suitable location to install the SP-100. The wall material and mounting screws should be of sufficient strength to bear the load of the SP-100 (approx. 10 lbs).

Step 2 Take the chassis out of its packaging and put it on an antistatic surface. If necessary, use canned compressed air to blow off any dust particles.

Step 3 Secure the SP-100 wall mounting brackets to the SP-100 using two M3x5 CSK POZI A2 screws each. See Figure 35 on p. 93.

WARNING To avoid overheating and the risk of fire, do no block airflow through the SP-100. Leave at least 3 inches (7 cm) of space above and below the unit to provide sufficient air flow.

Step 4 Use the wall mounting brackets as a template for marking holes. Drill mounting holes and insert wall anchors, as required.

Step 5 Attach the SP-100 mounting bracket to the wall using wall anchors and screws. See Figure 35 on p. 93.

End of Procedure

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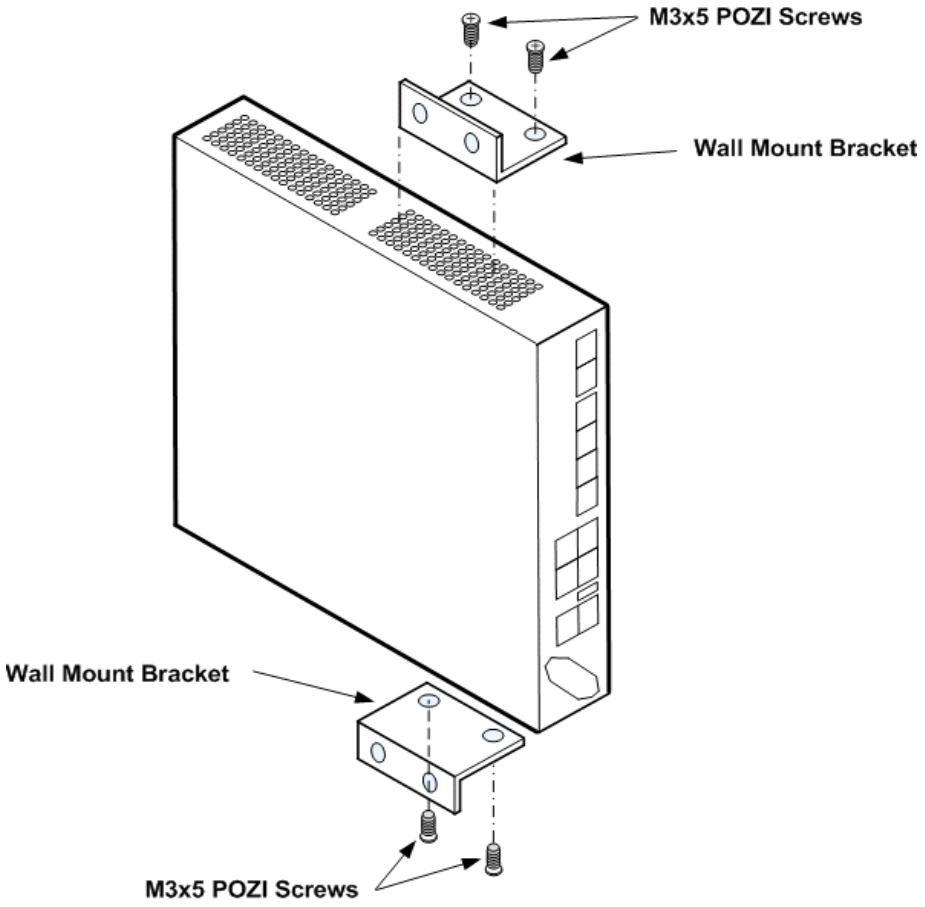
Figure 35: Installing Wall Mounting Brackets



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Installing a Standalone Chassis

Use the following procedure to install a chassis in a cabinet or on a desk. The SP-100 is cooled by radiating heat from the chassis. If the SP-100 is to be placed on a desktop or in a communications closet environment, it is recommended that nothing be placed on top of the unit or within 3 inches (7 cm.) of either side.

Procedure

Step 1 Take the chassis out of its packaging and put it on an antistatic surface. If necessary, use canned compressed air to blow off any dust particles.

Step 2 Mount four rubber feet to the bottom of the unit near each corner. (Four white rubber feet are included in the Accessory Kit, which is shipped with each unit.)

Step 3 Place the chassis on a secure flat surface, making sure that it is within reach of the necessary connections.

End of Procedure

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Route and Connect Copper Cables

Use the following for connecting copper cables:

- Two Ethernet combination ports that may be configured for copper (10/100/1000 BaseT) or optical (100BaseFX/1000BaseX). Port 1 is always designated as a Network port. Port 2 is always designated as an Access port.
- Ethernet DCN connection (labeled MGMT LAN)
- Local Serial port (labeled RS-232)
- USB port
- BITS IN and BITS OUT Ports, RJ-48c connectors
- Time of Day Input Connector, RJ-45 RS-422/RS-232 port (labeled TOD)
- Pulse Per Second Input and Input/Output Connectors (labeled PPS In and PPS)
- External (10MHz) Frequency Reference Input and Input/Output Connectors (labeled CLK In and CLK)

Observe the following precautions for connecting copper cables:

WARNING The intra-building port(s) of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the Outside Plant (OSP) or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 5) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

This product contains electro-static sensitive devices.

Appropriate anti-static handling precautions should be followed (i.e., IEC 61340-5-1:1998).

Note For Class B EMI required sites, a Category 6 or 7 cable terminated with RJ-45 / RJ-48c connectors is required for all metallic interface connections. For Class A EMI required sites, a Category 5 cable terminated with RJ-45 / RJ-48c connectors may be used.

- Optional ground cable on the back panel

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Access / Network Interface Copper Cables

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-45 connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ-45 connectors may be used. The cable should be no longer than 100m and should be compliant with the Institute of Electrical and Electronics Engineers (IEEE) 802.3:1998 Ethernet standard. See “LAN Connector Pin Assignments” on p. 120.

Note

For effective environmental protection from external objects of any kind, the SP-100 is intended to be protected from dust and particles with all covers complete. To ensure that all components are adequately protected, do not operate the SP-100 for extended periods without supplying plugs for vacant electrical and optical ports.

Note

The copper connection has Auto MDIX enabled, which allows straight-through or cross-over cables to be used.

Procedure

Step 1 Route the Access / Network interface cable(s) from the SP-100 to the appropriate location. Repeat for each additional port as needed.

Step 2 Connect one end of the Ethernet cable to the Access / Network Interface port on the front panel of the SP-100. Repeat for each additional port as needed.

Step 3 Connect the other end of the Ethernet cable to the Customer Equipment. Repeat for each additional Access / Network Port copper cable.

Step 4 Dress cables, as required.

End of Procedure

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Ethernet DCN Connections

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-45 connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ-45 connectors may be used for connection to a DCN port. See “LAN Connector Pin Assignments” on p. 120.

Procedure

Connect an Ethernet cable from a PC or Laptop to the DCN connection, as follows:

Step 1 Route the DCN Ethernet cable from the SP-100 to the appropriate location.

Step 2 Connect one end of the Ethernet cable to the 10/100BASE-T Ethernet port of the DCN PC or Laptop.

Step 3 Connect the other end of the Ethernet cable to the RJ-45 Ethernet port (labeled Management LAN) on the front panel of the SP-100.

Step 4 Dress cables, as required.

End of Procedure

Serial Console Port Connection

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-45 connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ-45 connectors may be used. An adapter to the PC serial port (F, DB9) is required. See “Serial Console Port Connector Pin Assignments” on p. 121. (The Serial Console Adapter is shipped with the unit in the Accessory Kit, and may also be ordered separately; Part Number 1036904035.)

Note

This connection may be made prior to provisioning the SP-100 (see “Operations Provisioning” on p. 153).

Procedure

Connect a Category 5, 6, or 7 cable for serial interface from a PC or Laptop to the SP-100 RS-232 port, as follows:

Step 1 Route the serial console port cable from the SP-100 to the appropriate location.

Step 2 Connect one end of the cable to an unused DB-9 RS-232 port on the PC or Laptop using the RJ-45 to F, DB9 adapter (ADVA Optical Networking PN 2036904035-01 or 1036904035, see “Serial Console Port Connector Pin Assignments” on p. 121).

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Step 3 Connect the other end of the cable to the RJ45 connector labeled RS-232 on the front panel of the SP-100.

Step 4 Dress cables, as required.

End of Procedure

USB Port Connections

Insert the 3G modem into the USB port. Available ADVA Optical Networking qualified 3G modems are as below:

- ZTEMT 119
- HW E1750

If cable extension is required, an ADVA Optical Networking qualified cable must be used.

GPS Port Connections

Refer to the following table for SP-100 hardware compatibility for GPS/GNSS connection:

Table 11: SP-100 GPS/GNSS Compatibility

SP-100 Hardware Version	Hardware Ready for GLONASS/Galileo?	GPS/GNSS Antenna Power Supply	OCXO
1.01	No	3.3V	Stratum 3+
1.02	No	3.3V	Stratum 3E
1.03	Yes	5V	Stratum 3E

The noise figure for the external GNSS Antenna LNA should be as low as possible, with a recommended maximum of 1.5 dB.

Note

It is recommended that the gain of the GNSS Antenna LNA exceeds the antenna cable loss that is measured from the GNSS Antenna output to the device Antenna input by 10 dB. For example, if the cable loss is 10 dB, the recommended minimum gain for the GNSS Antenna LNA is 20dB. In order to keep losses at the antenna input to a minimum, it is recommended to keep the antenna cable as short as possible.

Connect the antenna cable into the GPS port.

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BITS IN and BITS OUT Cables

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-48c connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ-48c connectors may be used for connection to BITS IN and BITS OUT ports. See "RJ-48c BITS Connector Pin Description and Assignments" on p. 122.

Procedure

Step 1 Route the BITS IN and BITS OUT cable(s) from the SP-100 to the appropriate location.

Step 2 Connect the one end of the BITS cables to the appropriate location of the clocking device or cross-connect panel.

Step 3 Connect the BITS IN and BITS OUT cables to the appropriate connectors on the front panel of the FSP 150SP.

Step 4 Dress cables, as required.

End of Procedure

Time of Day Cable

For EMI Class B required sites, a Category 6 or 7 cable terminated with RJ-45 connectors is required for all metallic interface connections. For EMI Class A required sites, a Category 5 cable terminated with RJ-45 connectors may be used. for connection to a TOD port. See "Time of Day (TOD) Connector Pin Assignments" on p. 123.

Procedure

Step 1 Route the TOD cable from the SP-100 to the appropriate location. Dress cables, as required.

Step 2 Connect the one end of the TOD cable to the appropriate location of the clocking device or cross-connect panel.

Step 3 Connect the TOD cable to the TOD connector on the front panel of the SP-100.

End of Procedure

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Install SFPs and Route Optical Cables

Use the following information and procedures to install SFP interfaces, and connect optical cables to the Network Ports and Access Ports, as required.

Install SFP Interfaces

Each optical port of a SP-100 Service Module accepts a SFP Interface, depending on customer requirements. The interfaces are inserted into the appropriate ports on the front panel of each Service Module.

ADVA Optical Networking strongly encourages the use of ADVA Optical Networking sourced SFPs. No support will be provided for systems that use SFPs other than those sourced by ADVA Optical Networking. The SFP contains a software key that is checked by the SP-100 service module base unit prior to initialization. This check is performed to ensure that only ADVA Optical Networking approved SFP units are used. SFP units are individually qualified by ADVA Optical Networking to ensure the quality of the optical output and conformance to the Multiuser Agreement (MSA).

If the SFP transceiver and rate do not match the configured application, an SFP mismatch alarm is raised. The port is then configured to prevent traffic to pass. If SFP cannot pass ADVA Optical Networking check criteria, but SFP transceiver and rate do match the configured application, a “NON qualified SFP” standing condition is raised.

Refer to the “FSP 150 Ethernet Access Compatibility Matrix” document which contains up-to-date information on which SFPs are certified for each product. This document may be obtained through ADVA Technical Support or via the product support site on www.advaoptical.com.

WARNING

(1) The insertion of SFP Interfaces other than those approved by ADVA Optical Networking, even those approved for other ADVA Optical Networking products, will result in exceeding safety certification for the FSP 150SP.

(2) NEVER insert metal objects, such as a screwdriver or a finger with jewelry, into open SFP Interface slots when the FSP 150SP is powered on.

(3) To avoid eye injury from debris, always wear safety glasses when working with canned compressed air.

Note

For effective environmental protection from external objects of any kind, the SP-100 is intended to be protected from dust and particles with all covers complete. To ensure that all components are adequately protected, do not operate the SP-100 for extended periods without supplying plugs for vacant electrical and optical ports.

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Invisible Laser Radiation

(1) Laser equipment should only be installed by personnel competent in laser technology.

(2) SFP Interfaces, approved by ADVA Optical Networking are Class 1 laser devices, when inserted into the FSP 150SP.

(3) Do not stare into the beam of any SFP Interface or view directly with optical instruments.

CAUTION

(4) Output ports of the SFP Interfaces emit laser radiation which is invisible to the naked eye. The equipment uses laser diodes as fiber-optic transmitter sources which are inherently safe unless mis-handled. Mishandling and misuse can result in severe eye injury.

(5) Do NOT look directly into an optical fiber connector or an un-terminated receptacle with a magnifier, unless it is absolutely certain that no laser radiation is being emitted from the receptacle or the fiber.

This product contains electro-static sensitive devices.

Appropriate anti-static handling precautions should be followed (i.e., IEC 61340-5-1:1998).

Note

(1) When handling SFP Interfaces DO NOT touch any connections inside the device.

(2) Keep all ports and connectors free from dust. When not in use, fit both connector plugs and sockets with protective caps.

Note

SFP Interfaces are hot swappable. The power to the FSP 150SP does not need to be switched off during the installation of an interface.

Use the following procedure for installing an SFP Interface. Repeat the procedure for each SFP to be installed.

Procedure

Step 1 If so equipped, remove the protective cap from the appropriate port on the front panel of the Access Port or Network Port.

Step 2 Take the SFP Interface out of its packaging and put it on an antistatic surface. If necessary, use canned compressed air to blow off any dust particles.

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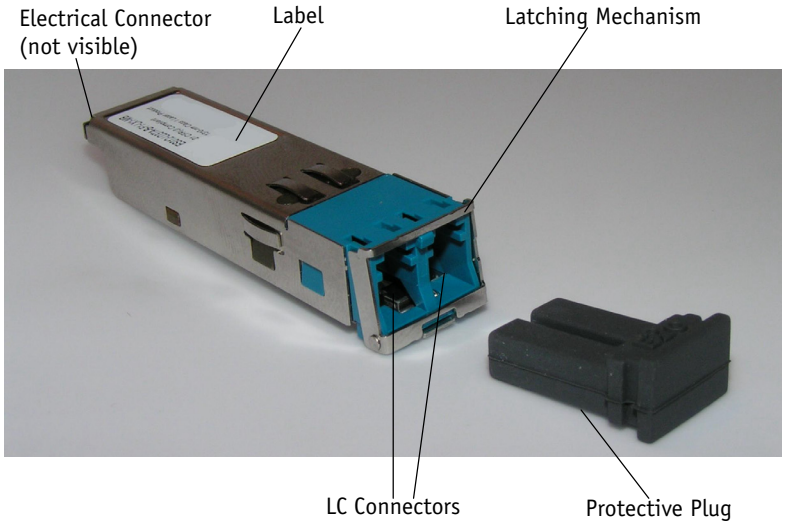
Step 3 Orient the SFP Interface until the duplex LC, simplex SC or RJ45 connector is facing you and the manufacturer's label is toward the Access Port or Network Port port interface's LEDs.



The latching mechanism may differ between SFP Interfaces supplied by ADVA Optical Networking.

Note

(1) SFP Interfaces can only be properly inserted one way. If the interface does not click when inserted, remove it, turn it over and reinsert.

(2) Force should not be required to insert a SFP Interface. If an interface does not insert easily, remove and inspect it, and if it is not damaged, reinsert.

Step 4 Holding the SFP Interface by its sides, gently slide it into the port slot until it clicks into place, or until it cannot be inserted any further.

End of Procedure

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Route Fiber Optic Cables

Refer to the following procedure when running fiber optic cables.

CAUTION

Follow local safety procedures regarding fiber optic cables. Never look at the end of a fiber optic cable. Permanent eye damage or blindness can occur. All optical connectors are shipped with protective caps. Ensure that protective caps are firmly in place before running any fiber optic cables.

CAUTION

Never handle exposed fiber optic cables with bare hands or touch it to your body. A fiber fragment could enter the skin and be very difficult to detect and remove.

NOTICE

Prevent damage to fiber optic cables. Do not bend fiber optic cables to a radius less than 50 mm.

NOTICE

To avoid damage to optical receivers, do not connect any fibers until instructed to do so. Always check optical levels before connecting fiber optic cables.

Procedure

Step 1 Route all fiber optic cables from the SP-100 to the appropriate location. **Do not** connect the cables to the SP-100 connectors at this time. They will be connected later.

Step 2 Dress all fiber optic cables. Use local practices for protecting all cables and connectors.

End of Procedure

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Connect Power Cables and Apply Power

The system is powered by either an internal AC and/or DC Power Supply. They are physically accessed at the front of the unit where source connections are provided. DC PSUs have an input polarity guard. If the power is connected with the polarity reversed, the unit does not power up.

Connect the power cables and apply power to the SP-100 using the following procedure.

Use the following precautions when connecting power cables and applying power to the SP-100.

WARNING

(1) ALWAYS remove power from supply leads when connecting or disconnecting DC power cables, and always ensure that the protective earth terminal is grounded, otherwise there is a risk of severe electrical shock and personal injury.

(2) ALWAYS connect the accessory 3-pin power cord to a 3-pin grounded power outlet when supplying AC power to the SP-100. If power is supplied without the protective earth grounded, there is a risk of severe electrical shock and personal injury.

(3) Two SP-100 DC variants are available. The -48 VDC (nominal) variant and a +24 VDC (nominal) variant. Each is designed for use with a telecommunications DC supply. As such, this should only be installed in a restricted access location by trained personnel.

(4) When connecting to a 240v AC supply, the unit should be connected using a 3 Amp double pole branch circuit breaker.

(5) Circuit Overloading - Consideration should be made when connecting the equipment to the supply circuit. Consider the effect overloading the circuits might have on current protection and supply wiring. Appropriate consideration of the equipment current rating should be taken when addressing this concern.

(6) For AC variants, the power inlet connector is the disconnect device. For DC variants, a readily accessible disconnect device should be incorporated in the building / RT installation wiring.

Note

When connecting power to a PSU make sure that the office supply is correct according to the rating label of the SP-100. The rating label can be found on the back of the SP-100.

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Connect Optional Earth (Frame Ground) Cable

An optional Earth (Frame Ground) connection may be attached to the Earth terminal point, located at the rear of the unit. Each SP-100 unit is supplied with an Earth Terminal Kit and a 10 foot, 16 gauge grounding cable, to facilitate this connection.

Note

A terminal tab is provided within the Earth Terminal Kit for optional push-on connection to the Earth terminal point, which is not the method described in the following procedure. The following procedure connects to a frame ground point using the provided ground cable:

Procedure

Step 1 Using the M4x6 RAIS Pozi screw and one lock washer provided with the Earth Terminal Kit, attach the 10 foot, 16 gauge grounding cable to the Earth terminal point located at the rear of the SP-100 unit. See Figure 36 on p. 105 and Figure 37 on p. 106.

Step 2 Connect the other end of the cable to the site designated grounding location (frame connecting point or ground bar location). See Figure 37 on p. 106.

Step 3 Dress the cable, as required.

End of Procedure

Figure 36: Rear Panel Frame Ground Point

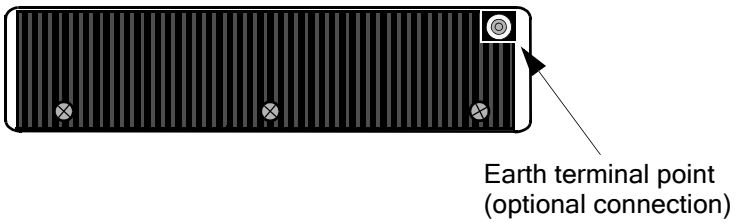

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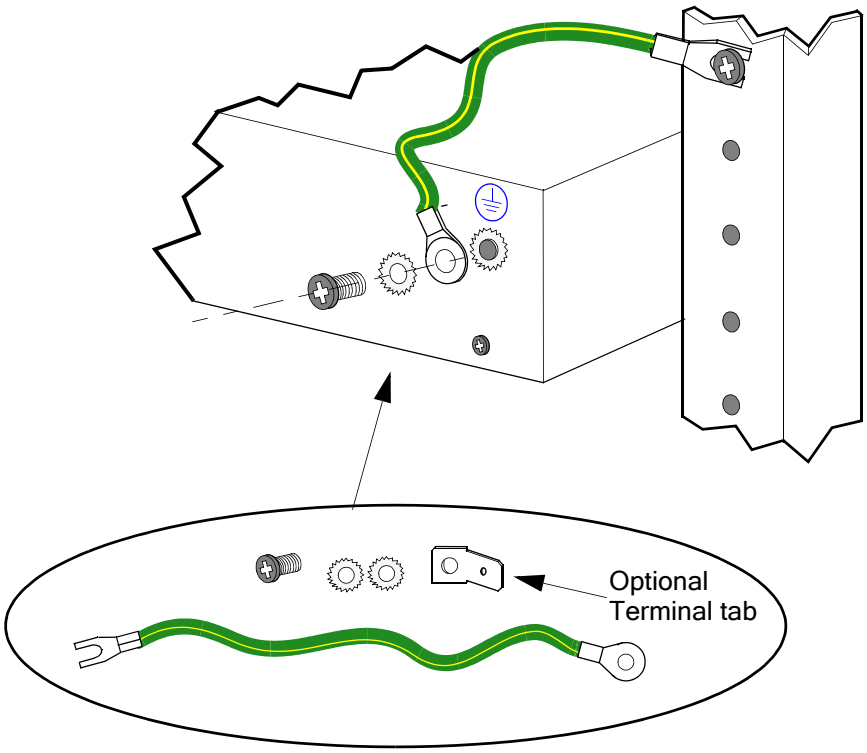
Figure 37: Grounding Detail



Earth Terminal Kit and Ground Cable (for optional grounding)

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Connect AC Power

The SP-100 AC variant operates with an AC source externally fused at 10 Amps, with a voltage range of 120 / 240 VAC nominal, 50-60Hz nominal. The system operates with an AC source with the voltage range specified in ANSI specification C84.1-1989, Voltage Ratings (60 Hz) for Electric Power Systems Equipment, Range B. The equipment shall tolerate any frequency within the range of 60 (+/-3) Hz. UK/EU Power requirements: EN50160 defines voltage characteristics in public distribution systems. Public low voltage is: 230 VAC +/-10% i.e., 207-253 VAC, 50Hz -6%/+4% (47- 52 Hz). Maximum power consumption for the SP-100 AC power supplies is 21 watts.

Use the following procedure to connect AC power to each of the AC power PSUs, as required.

Procedure

Step 1 Use an AC tester to verify the integrity of the AC outlet. Rectify any grounding, isolation, etc., issues identified.

Step 2 Route the AC power cable from the SP-100 to the designated power outlet, externally fused at 4 Amps.

Step 3 Connect the AC power cable to the SP-100 power connector.

Note

The AC variant PSU will require a right angled IEC power lead if the chassis is positioned in 19” ETSI racking.

Step 4 **Do Not** Insert the power plug into the power receptacle(s) at this time. They will be inserted later during the procedure.

Step 5 Dress cables, as required.

Step 6 Insert AC Power cable into AC receptacle. The Status LED on the SP-100 should be illuminated Green. Observe the system STA LED after applying power: See “Start-Up LED Sequence” on p. 112.

End of Procedure

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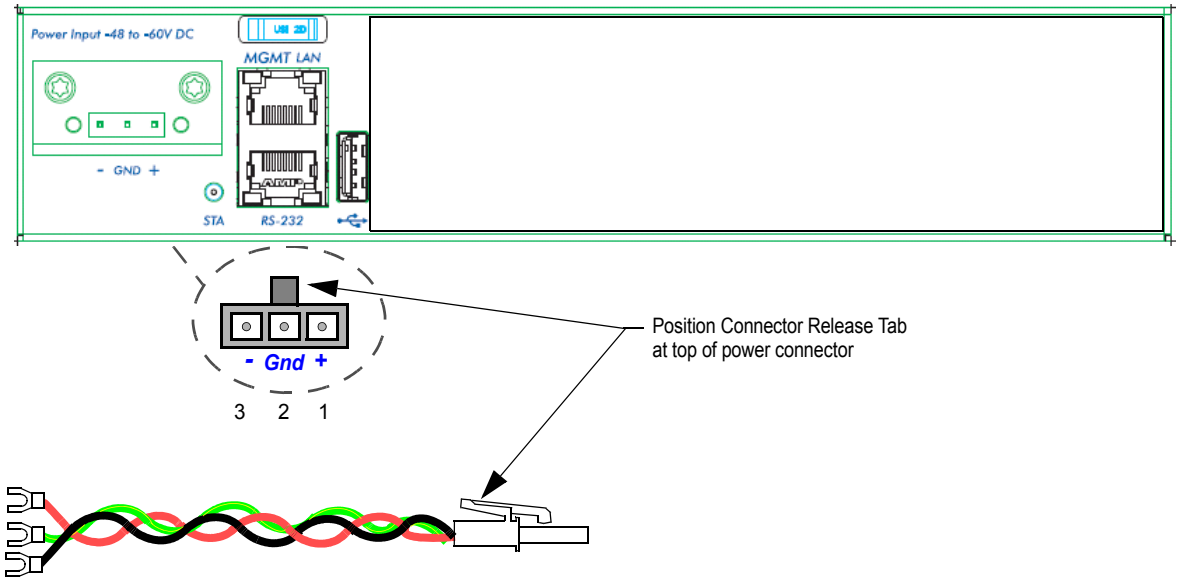
Connect -48 VDC Power

Use the following procedure to connect -48 VDC power to a SP-100 -48 VDC variant, as required. Maximum power consumption for the SP-100 is estimated at 21 watts for SP-100. Refer to "Power Supply Unit Connector Pin Assignments" on p. 118 for connector pin assignment information.

WARNING Avoid the risk of electrical shock. Follow local procedures for working with electrical power. High voltage may be present in the following tasks. Shut off the power from the power source or turn off the circuit breakers before proceeding. Use properly insulated tools when working with power connections. Do not allow any metal objects to connect across power terminals.

Figure 38: -48 VDC Power Supply Unit Connector



Procedure

Step 1 Verify that the office DC power supply is set up to deliver the correct operating voltage to the SP-100 (-48 or -60 VDC nominal). Verify that the correct fuse or breaker (4 Amp rating) is installed at the power supply source and that power is turned off. Repeat for a second -48 VDC power supply source, if applicable.

Step 2 Using a volt meter, measure the voltages at the source power supply terminals. Verify that no voltage is present.

Step 3 Run the DC power cables from the SP-100 to the designated office battery terminals. Dress cables as required.

WARNING When performing the following step, ensure that the proper polarity of the DC power is observed as miswiring could result in damage to the SP-100.

The SP-100 detects polarity reversal and does not power up when the polarity is reversed.

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Step 4 Remove the cover from the source power terminal strip. Connect the following wires to the source DC power supply terminals. Verify that all power terminal connections are tight and that no strands of wire are shorting terminals together. Wire size is 16 AWG for SP-100.

- **North American application**
  - Black Battery Return wire to the **+** terminal
  - Green/yellow Ground wire to the GND terminal
  - Red -48V Office Battery wire to the **-** terminal
- **European application**
  - Blue Battery Return wire to the **+** terminal
  - Green/yellow Ground wire to the GND terminal
  - Grey -48V Office Battery wire to the **-** terminal
- **DTAG application**
  - Black Battery Return wire to the **+** terminal
  - Green/yellow Ground wire to the **GND** terminal
  - Blue Office Battery wire to the **-** terminal

Repeat Step 4 for a second source DC power supply, if applicable.

Step 5 Route the wire harness to the SP-100. **Do Not** insert the power connectors at the SP-100 (see Figure 38 on p. 108). They will be inserted later during the power up procedure.

Step 6 Reconnect the office power source (reinstall fuses, reset breakers or turn on power supply).

Step 7 Use a volt meter to verify the power and ground at the source DC power supply terminals. Connect the positive voltmeter lead to the - terminal and the negative voltmeter lead to the + terminal. Ensure that the voltage between + and - terminals measures between -36 and -72 VDC.

Step 8 Using a volt meter, measure the voltage between **+** and **GND** terminals. Verify that 2 VDC or less is present. Replace the cover to the source power terminal strip.

Step 9 Dress cables as required.

Step 10 Insert the -48 VDC power connector(s) at the SP-100. The Status LED on the PSU(s) should be illuminated Green. Observe the system STA LED after applying power: See “Start-Up LED Sequence” on p. 112.

End of Procedure

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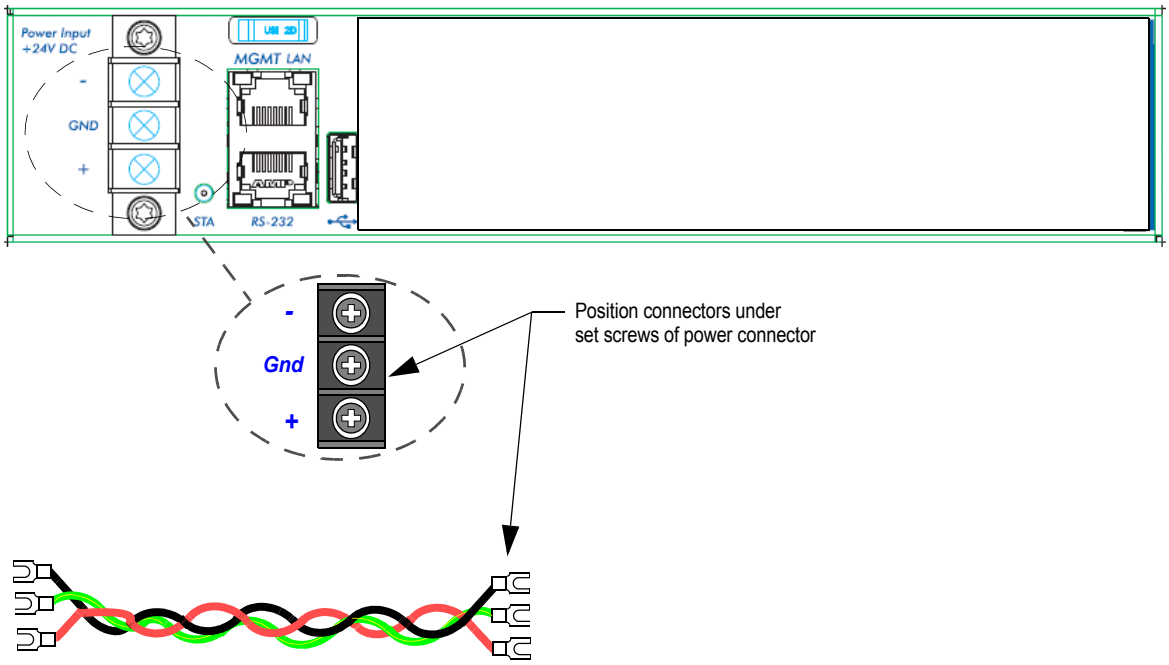
Connect +24 VDC Power

Use the following procedure to connect +24 VDC power to a SP-100 +24 VDC variant, as required. Maximum power consumption for the SP-100 is estimated at 21 watts for SP-100. Refer to "Power Supply Unit Connector Pin Assignments" on p. 118 for connector pin assignment information.

WARNING Avoid the risk of electrical shock. Follow local procedures for working with electrical power. High voltage may be present in the following tasks. Shut off the power from the power source or turn off the circuit breakers before proceeding. Use properly insulated tools when working with power connections. Do not allow any metal objects to connect across power terminals.

Figure 39: +24 VDC Power Supply Unit Connectors



Procedure

Step 1 Verify that the source +24 VDC power supply is set up to deliver the correct operating voltage to the SP-100 (+24 VDC nominal). Verify that the correct fuse or breaker (4 A rating) is installed at the power supply source and that power is turned off. Repeat for a second +24 VDC power supply source, if applicable.

Step 2 Using a volt meter, measure the voltages at the source power supply terminals. Verify that no voltage is present.

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Step 3 Run the DC power cables from the SP-100 to the designated battery terminals. Dress cables as required.

WARNING When performing the following step, ensure that the proper polarity of the DC power is observed as miswiring could result in damage to the SP-100.

The SP-100 detects polarity reversal and does not power up when the polarity is reversed.

Step 4 Remove the cover from the source power terminal strip. Connect the following wires to the source DC power supply terminals. Verify that all power terminal connections are tight and that no strands of wire are shorting terminals together.

- **North American application**
  - Black Battery Return wire to the **–** terminal
  - Green/yellow Ground wire to the **Gnd** terminal
  - Red +24V wire to the **+** terminal
- **European application**
  - Blue Battery Return wire to the **–** terminal
  - Green/yellow Ground wire to the **Gnd** terminal
  - Grey +24V wire to the **+** terminal

Step 5 Route the wire harness to the SP-100. Connect the following wires to the DC power supply terminals at the SP-100 (see Figure 39 on p. 110). Verify that all power terminal connections are tight and that no strands of wire are shorting terminals together.

- **North American application**
  - Green/yellow Ground wire to the **Gnd** terminal
  - Black Battery Return wire to the **–** terminal
  - Red +24V wire to the **+** terminal
- **European application**
  - Green/yellow Ground wire to the **Gnd** terminal
  - Blue Battery Return wire to the **–** terminal
  - Grey +24V wire to the **+** terminal

Step 6 Reconnect the power source (reinstall fuses, reset breakers or turn on power supply).

Step 7 Use a volt meter to verify the power and ground at the SP-100 power terminals. Connect the positive voltmeter lead to the + terminal and the negative voltmeter lead to the - terminal. Ensure that the voltage between + and - terminals measures between +18 and +30 VDC.

Step 8 Using a volt meter, measure the voltage between **+** and **GND** terminals. Verify that 2 VDC or less is present. Replace the cover to the source power terminal strip.

Step 9 The Status LED on the SP-100 should be illuminated Green. Observe the system STA LED after applying power: See “Start-Up LED Sequence” on p. 112.

Step 10 Dress cables as required.

End of Procedure

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Start-Up LED Sequence

Following Power On the modules in the SP-100 will take several seconds to boot up/start up. During this time, the **Status** Indicators will indicate where in the boot up and start up sequence that module is. The LED function is used for signaling local operators within visible range the current status of shelves, cards, and interfaces on ADVA Optical Networking devices.

A start-up condition takes place when a device initially powers up or when the device is set to do a hard reset when triggered by the backplane reset signal. The guidelines in this section are implementation specific as cards may support different types of boot sequences depending upon the technology used.

Figure 40 on p. 113 illustrates the LED transitions for a typical device during start-up.

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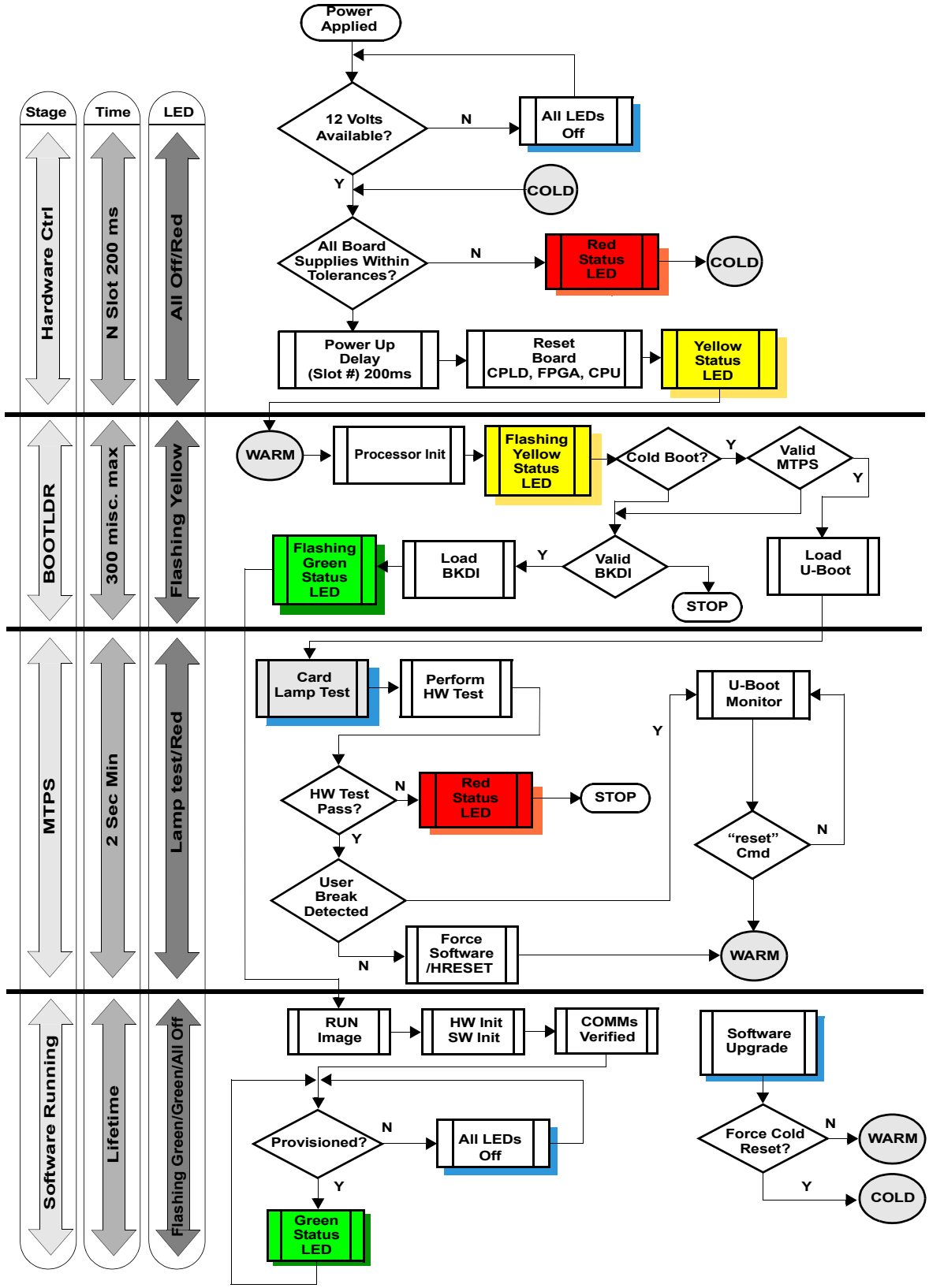
Figure 40: LED Flow Diagram



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LED Start-Up

Use the following procedure shows the sequence of LEDs during start-up. Please note that the following steps can complete so quickly that you may not see a particular LED transition.

Procedure

Step 1 Power up the SP-100 by applying power to the SP-100 while observing the following start-up sequence:
- Insert the power plug into the AC power receptacle
- Insert the power connectors at the SP-100 -48 VDC / +24 variant

Step 2 Red - Between power up of the power controller on the card and the other power supplies being enabled and before they are all within acceptable tolerance of nominal, the Status LED is red; all other LEDs are off during initialization.

Step 3 Yellow - The Status LED transitions from red to yellow after the voltage rails have come up and while the card is configuring hardware or performing hardware tests (i.e., configuration of FPGA, CPLD, and CPU).

Step 4 Once the hardware devices have been configured the Status LED will be begin to flash Yellow with a frequency of 1Hz +/- 0.5Hz.

Step 5 After the U-Boot software has loaded, a power on lamp test is executed where all LEDs are lit for two seconds. See “LED Start-Up” on p. 114.

Step 6 Next, hardware tests are performed. If there are no failures, the sequence continues. If there is a hardware failure, the Status LED is red and the sequence stops.

Step 7 WARM Start: If the card has been WARM started, the sequence begins here. If this is a cold start sequence then the previous steps are executed and a forced warm restart is performed. Once the CPU has been initialized the Status LED will begin to flash Yellow with a frequency of 1Hz +/- 0.5Hz.

Step 8 Now, the image is validated. If the image is bad, the sequence stops and the Status LED will continue to flash Yellow. If the image is good, the Status LED will begin to flash Green with a frequency of 1Hz +/- 0.5Hz.

Step 9 The status LED then reverts to normal behavior (either Green – provisioned, or Flashing Red- equipment mismatch).

Step 10 If, during the boot sequence or during normal operation, a fault is detected on the card in Hardware, Firmware, or Software, the Status LED will be lit red indefinitely. This indicates that the card cannot recover.

End of Procedure

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Power On Lamp Test

The SP-100 performs a Power On Lamp Test. This lamp test occurs during the module start up sequence (see “LED Start-Up” on p. 114).

During the test, all module indicators illuminate for two seconds and then the indicators return to normal operation (dual color LEDs will light a mix of colors, i.e., Red + Green will be Orange).

Measure Optical Power

Using an optical power meter calibrated for the appropriate wavelength, check the power budgets and the transmit levels of optical Access and Network Interface connections by performing the following procedure for each.

Procedure

Step 1 Take optical power measurements for:
- the Tx port
- the Rx fiber before insertion

Step 2 Compare the optical power measurements made, and add attenuation if necessary (see “Optical Attenuation” on p. 115).

End of Procedure

Optical Attenuation

When making optical power measurements the following guidelines generally apply:

For Access Interface connections:

- the power measured at the Rx input should be within the range of the Access ports Rx level
- the power measured at the input to the customer equipment should be within the range of the customer equipment’s Rx level.

For Network Interface connections:

- the Rx input should be within the range of the Network ports Rx level

In some cases it is necessary to attenuate the optical signal power to meet the specification of the SP-100 (see the “FSP 150 Ethernet Access Compatibility Matrix” at www.advaoptical.com) or the specifications of customer equipment.

Variable or fixed attenuators in the range of -3dB to -11dB can be placed, as appropriate, at the:

- Rx and Tx Access Interface connectors
- Rx and Tx Network Interface connectors

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Install an optical attenuator by plugging the appropriate fiber-optic cable into the attenuator and installing the cable/attenuator combination at the appropriate connector socket.

Clean Fiber Connections

Clean all fiber connections prior to connecting fiber optic cables.

WARNING Isopropyl alcohol can cause eye irritation. Follow the precautions given by the optical fiber cable manufacturer. Working with compressed air can cause debris to fly into your eyes. To avoid injury, wear safety glasses when you work with isopropyl alcohol and compressed air.

Note

Fiber-optic end surfaces must be smooth and clean before connection.

To ensure that all fiber connectors are clean, thoroughly clean the connectors using a lint free, non abrasive wipe or pad.

Precautions When Connecting Fiber Optic Cables

Refer to the following precautions when connecting fiber optic cables.

WARNING

NEVER insert metal objects, such as a screwdriver or a finger with jewelry, into open SFP Interface slots when the SP-100 is powered on.

NOTICE Fiber-optic cables can be damaged if they are handled or routed improperly. Do not bend fiber optic cables to a radius less than 50 mm.

NOTICE Keep all ports and connectors free from dust. When not in use, fit both connector plugs and sockets with protective caps.

Note

When cabling SFP Interface optics, note that Rx ports are on the right (bottom) and Tx ports are on the left (top).

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Connect Fiber Cables to Access Port or Network Port

Use the following procedure to connect fiber optic cables to the Access Port or Network Port Interfaces.

Procedure

Step 1 Remove the protective caps from both connector plugs and sockets.

Step 2 Connect the fiber cables depending upon the deployment scenario:

For direct connection to another FSP 150SP:

- the near end Tx port is connected to the far end Rx port
- the near end Rx port is connected to the far end Tx port.

For connection via a core active network:

- the Tx port is connected to the Rx port of the Switch or Router
- the Rx port is connected to the Tx port of the Switch or Router

End of Procedure

To Power Off

For maintenance or transport purposes, it may be necessary to power down the SP-100. In which case, use the following procedure to do so.

WARNING

ALWAYS remove power from the PSU to ensure that the SP-100 is electrically inert.

To power off the SP-100, use the following procedure.

Procedure

Step 1 Turn off the -48 VDC or +24 VDC power supply to the SP-100 DC variant power connector, or remove the power cable from the AC outlet for a SP-100 AC variant.

End of Procedure

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Connector Pin Assignments

Power Supply Unit Connector Pin Assignments

Refer to the following for -48 VDC and +24 VDC PSU connector pin designations and cable wire assignments.

Figure 41: -48 VDC Power Supply Unit Connector

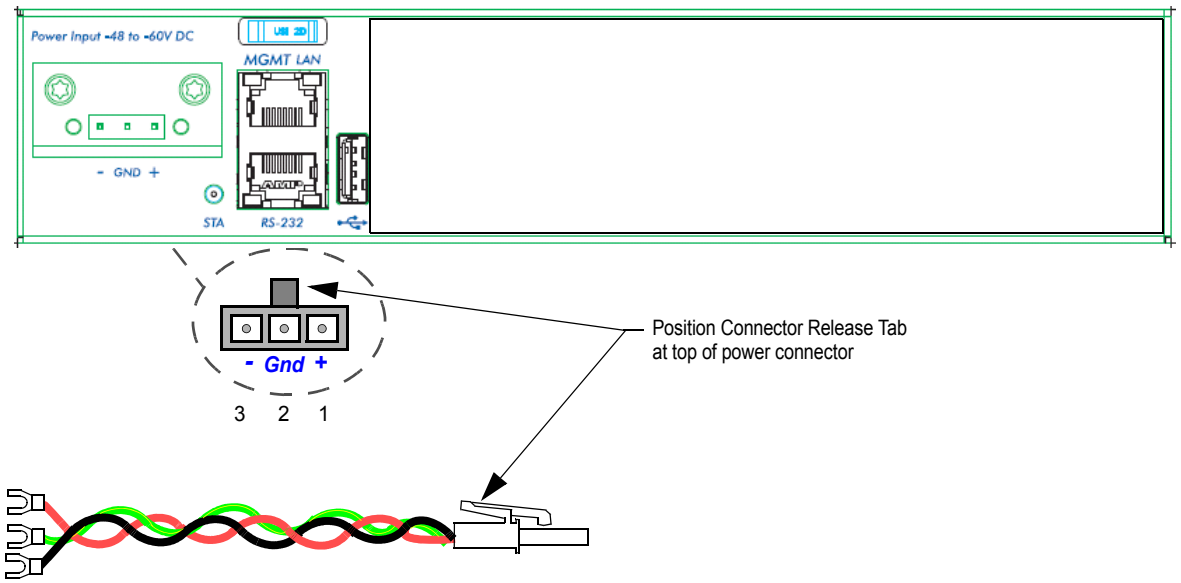

Table 12: -48 VDC PSU Cable Wire Assignments

Pin Number	PSU Connection	Connector Description	European Wire Color	North American Wire Color
1	+	Return for battery source	Blue	Black
2	Gnd	Ground	Yellow / Green	Yellow / Green
3	–	-48 VDC, 5A Battery	Grey	Red

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Figure 42: +24 VDC Power Supply Unit Connectors

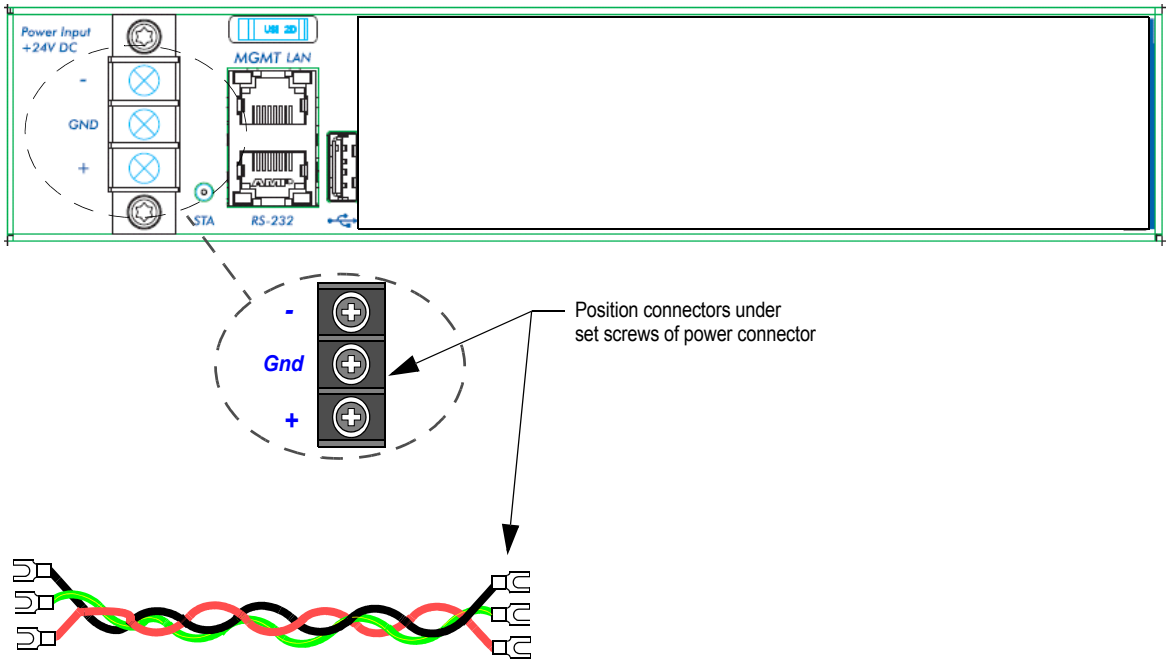

Table 13: +24 VDC PSU Cable Wire Assignments

PSU Connection	Connector Description	European Wire Color	North American Wire Color
+	+24 VDC, 5A Battery	Grey	Red
Gnd	Ground	Yellow / Green	Yellow / Green
-	Return for battery source	Blue	Black

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LAN Connector Pin Assignments

Refer to Table 14 on p. 120 for the RJ-45 10/100 Base-T connector pin assignments and refer to Table 15 on p. 120 for 1000 Base-T LAN port connector pin assignments.

Table 14: 10/100 Base-T LAN Port (RJ-45 Connector)

MDI	MDI-X	10/100 Base-T Signal Name
1	3	TX+
2	6	TX-
3	1	RX+
4	7	–
5	8	–
6	2	RX-
7	4	–
8	5	–

Table 15: 1000 Base-T LAN Port (RJ-45 Connector)

MDI	MDI-X	1000 Base-T Signal Name
1	3	BI D1+
2	6	BI D1-
3	1	BI D2+
4	7	BI D3+
5	8	BI D3-
6	2	BI D2-
7	4	BI D4+
8	5	BI D4-
BI D = Bi-directional Data		

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Serial Console Port Connector Pin Assignments

The SP-100 is a DCE device, refer to the following table for the RJ-45 (RS-232 Serial Console port) connector pin assignments, which follows the EIA/TIA-232-F standard. The installation kit also provides an RJ-45 to DB9 conversion adapter (pin assignments are shown in the following table).

Table 16: RJ-45 (RS-232 Serial Console Port) and DB9 Adapter Pin Assignments

Signal Name	Description	RJ-45	DB9
–	Not used	1	–
DSR	Data Set Ready	2	6
DTR	Data Terminal Ready	3	4
SG	Signal Ground	4	5
RXD	Receive Data	5	2
TXD	Transmit Data	6	3
CTS	Clear To Send	7	8
RTS	Request To Send	8	7

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RJ-48c BITS Connector Pin Description and Assignments

T1/E1 External Clock Input connector (labeled BITS IN) and T1/E1 External Clock Output connector (labeled BITS OUT) are both front mounted RJ-48c balanced 120 Ohm connectors.

Refer to the following tables for the BITS OUT (T4) and BITS IN (T3) connector pin assignments.

Table 17: RJ-48c, BITS IN (T3) Input Connector

Pin Number	Signal	Description
B1	RRING	Receive Ring
B2	RTIP	Receive Tip
B3	GND	Ground
B4	–	–
B5	–	–
B6	GND	Ground
B7	GND	Ground
B8	GND	Ground

Table 18: RJ-48c, BITS OUT (T4) Output Connector

Pin Number	Signal	Description
B1	–	–
B2	–	–
B3	GND	Ground
B4	TRING	Transmit Ring
B5	TTIP	Transmit Tip
B6	GND	Ground
B7	GND	Ground
B8	GND	Ground

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Time of Day (TOD) Connector Pin Assignments

The Time of Day connector (labeled TOD) is a front mounted RJ-45 connector, with an input/output capable function. The system supports a Time of Day input on which it can receive coded Time of Day inputs from a GPS receiver.

Refer to the following table for detailed pin assignments.

Table 19: TOD RJ-45 Connector and Pin Assignments

Pin Number	Port Direction = Input	Port Direction = Output
T1	–	–
T2	–	–
T3	PPS_IN -	PPS_OUT -
T4	GND	GND
T5	GND	GND
T6	PPS_IN +	PPS_OUT +
T7	TOD_RX -	TOD_TX -
T8	TOD_RX +	TOD_TX +

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Chapter 3

eVision Web Browser Management Tool

Introduction

The eVision web browser management tool provides a Graphical User Interface (GUI) for Operation, Administration and Maintenance (OAM) functions. The eVision provides comprehensive support for fault, configuration, performance and security functions from a web browser (see “Minimum System Requirements” on p. 129) on a computer connected to the DCN port (see Figure 43 on p. 126).

This chapter describes eVision and the features it provides to manage the FSP 150SP equipment. The chapter provides the following information:

- logging on and off
- getting familiar with eVision
- eVision Applications descriptions

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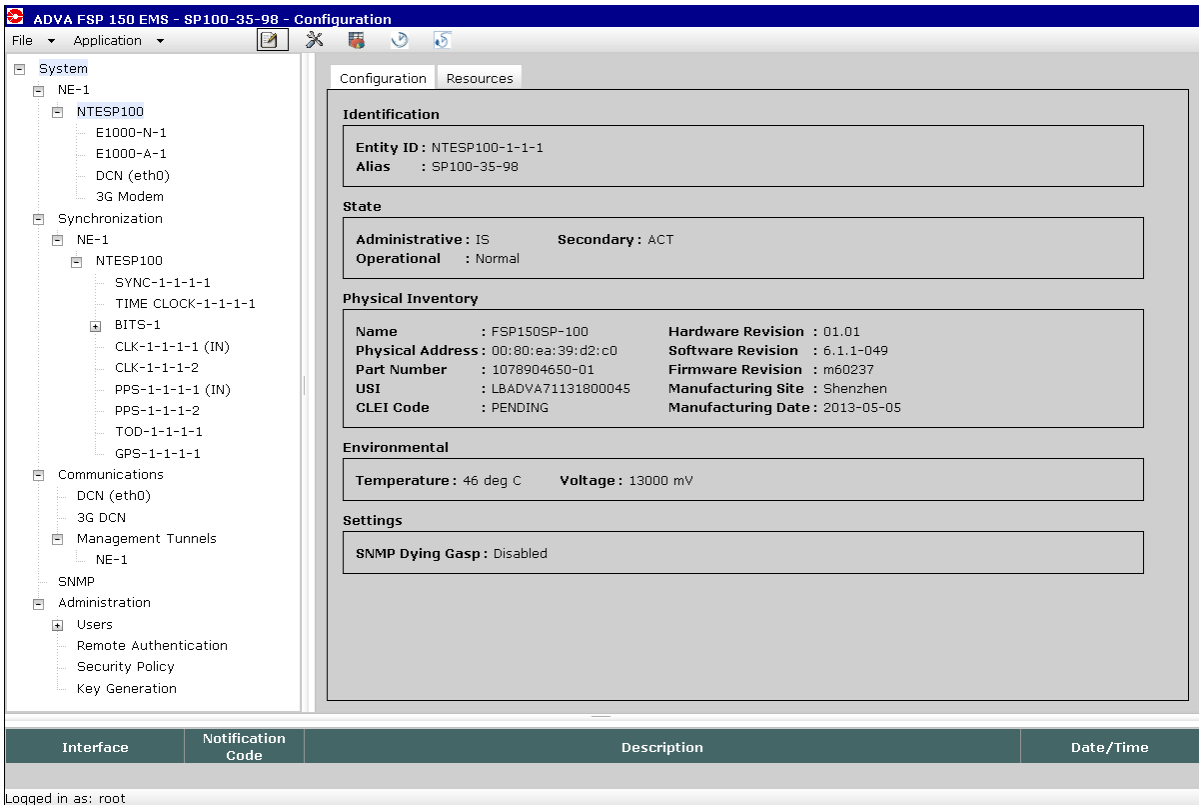
Figure 43: eVision Web Browser Management Tool



To access eVision, the FSP 150SP must first be configured with an Internet Protocol (IP) address and subnet mask. Details on how to do this are provided in “Provision Communications” on p. 274.

eVision provides the user with the following major applications:

Alarms Pane

The Alarms Pane provides quick visibility and access to current alarms. Alarms are color-coded based on severity. The Alarms Pane is always displayed no matter what application is currently selected, thereby providing continuous alarm monitoring.

Configuration

This provides the user with the ability to:

- view the current status of the FSP 150SP system
- view the current configuration of the FSP 150SP system
- provision the FSP 150SP for operation.

See “Configuration View” on p. 143 for further details.

Maintenance

This provides the user with a single view from which to perform all testing and maintenance related operations, such as:

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- view current conditions
- reboot system, perform lamp test, raise/clear test alarm
- Ping, trace route, flush ARP cache
- loopbacks
- perform sync reference switching
- edit alarm attributes
- software upgrade
- database management
- CLI configuration file management
- Software Licensing

See "Maintenance View" on p. 145 for further details.

Performance Monitoring (Network and Access Ethernet Ports)

This provides the user with the ability to:

- obtain Performance Monitoring (PM) reports and chart them
- view and configure Performance Parameter threshold values

See "Performance Monitoring View" on p. 151 for further details.

Precision Time Control (PTP)

The Precision Time Protocol (PTP) feature provides the ability to create and monitor End-to-End (E2E) functionality and Telecom Slave (TS) functionality for use in high accuracy time and frequency synchronization applications. Functions supported include:

- create/edit/delete telecom slave
- create PTP Flow Point (PTPFP)
- monitor/configure PTPFP statistics
- create/edit/delete Slave Only Ordinary Clock (SOOC)
- monitor/configure SOOC statistics
- create/edit/delete Ordinary Clock Slave (OCS) Port
- edit alarm attributes for SOOC and TS

SyncJack

Monitor and analyze clock and PTP Network. Functions supported include:

- view overall sync network status
- clock accuracy
  - create/edit/delete clock probe
  - monitor TIE-History measurements

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- clock analysis
  - create/edit/delete PTP clock probe
  - monitor TIE-History estimations
  - monitor/edit Telecom Slave analysis
  - edit TS thresholds
- PTP network analysis
  - create/edit/delete PTP network probe
  - monitor PTP network probe statistics
  - edit PTP network probe thresholds
- manage SyncJack schedules

Users and Security

Users and associated security levels can be viewed, entered and modified by the Superuser. Other users can view and modify their own user accounts. For more information, see “Configure Local Users” on p. 176.

Software Upgrade

Software may be easily updated to the current release level using the Browser Management Tool provided by the GUI interface. For more information, see “Upgrade Software Version” on p. 154.

Database Configuration Management

Operations available for managing configuration data are: determining database configuration status, restore system defaults, backup database and restore database, modify the system default database, reset to system defaults, reset to factory defaults and change the default value file. For more information, see “Database and Configuration Files” on p. 236, “Restore Database” on p. 248 or “Restore System Defaults” on p. 252.

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Minimum System Requirements

Prior to running eVision, ensure that the management system Personal Computer (PC) meets the following minimum system requirements:

- 200Mhz processor
- supported Operating System (OS) versions: Microsoft Windows XP/Vista/7
- A browser such as Internet Explorer 5.0 or greater (IE 8.0 recommended) or Firefox 2.0 or greater (Firefox 3.6 recommended). Other browsers may suffice, no browser is certified by ADVA Optical Networking.
- 128 Mb of Random Access Memory (RAM)
- Adobe Acrobat Reader 5.0 or greater (6.0 is included)
- Recommended display: 1024 x 768 with 16+ color bits.

Note

If using Internet Explorer 8, in order to view certain eVision elements correctly (namely data provided in Maintenance View - e.g., Restore factory defaults, Restore system defaults, Restore database, New System Defaults File), enable Compatibility View in IE by selecting Tools, Compatibility View Settings and adding the FSP 150SP IP address to the list of websites data field.

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Logging On and Off

Logging On

Use the following procedure to log on to the FSP 150SP eVision web browser management tool.

This procedure assumes that HTTP and HTTPS access is enabled (factory defaults).

Procedure

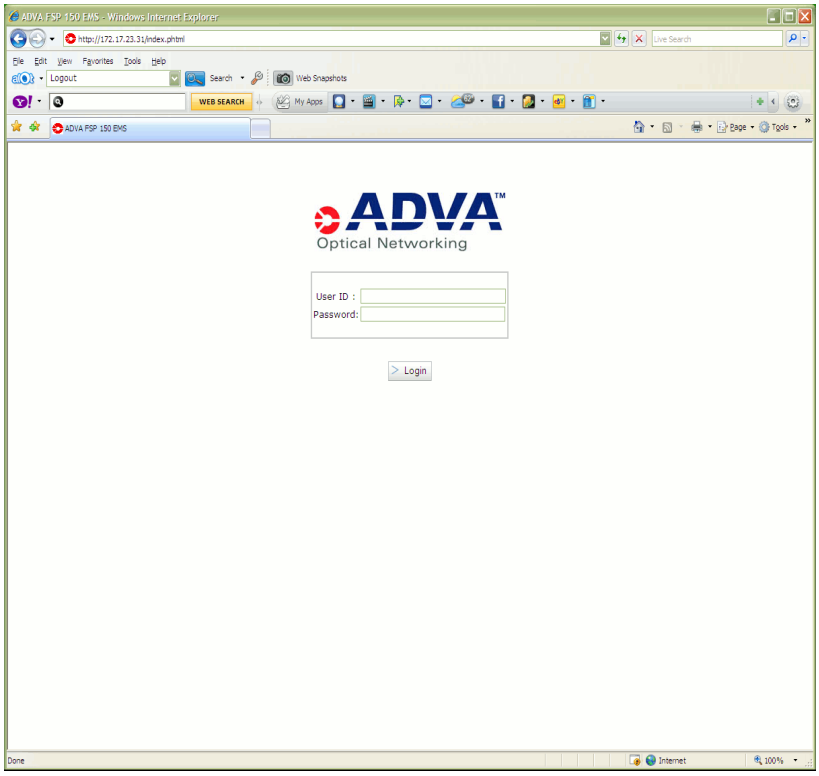
Step 1 Ensure that a DCN connection to the FSP 150SP has been established, or the PC is connected to the DCN port, as required.

Step 2 Open up the appropriate Internet Browser and enter the following address:

`http://xxx.xxx.xxx.xxx`

were `xxx.xxx.xxx.xxx` is the IP address of the DCN that the FSP 150SP is connected to. This will be the IP address that has been assigned to the DCN port (eth0) during initial IP configuration, or if none has been set, the default address of 192.168.0.2.

eVision opens and the Login Screen is displayed, as shown below:



Step 3 Enter a valid User ID and Password (default is **root** and **ChgMeNOW**, respectively). See “Provision Secure Access” on p. 171 for additional login information.

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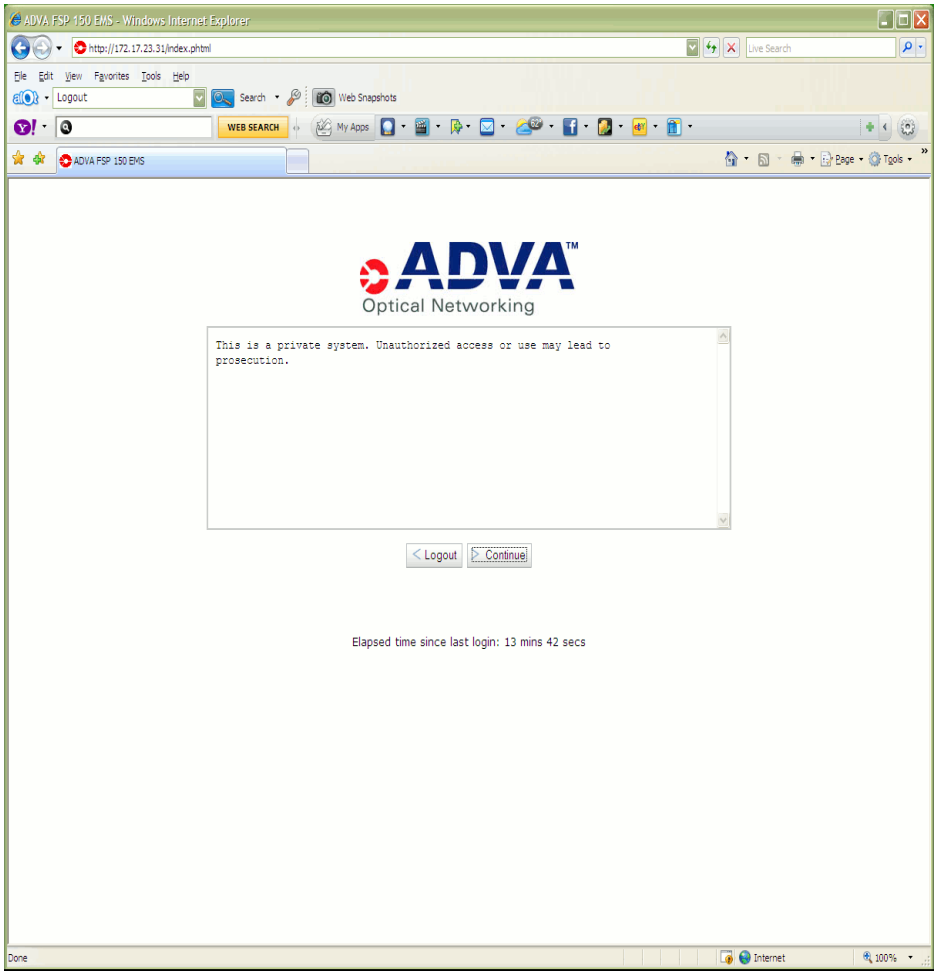
Step 4 Select **Login**.

The security banner displays, as shown below.



Note

A login account will be locked for a period of 5 minutes after 3 unsuccessful login attempts.

Step 5 Select **Continue**.

eVision displays, as shown below

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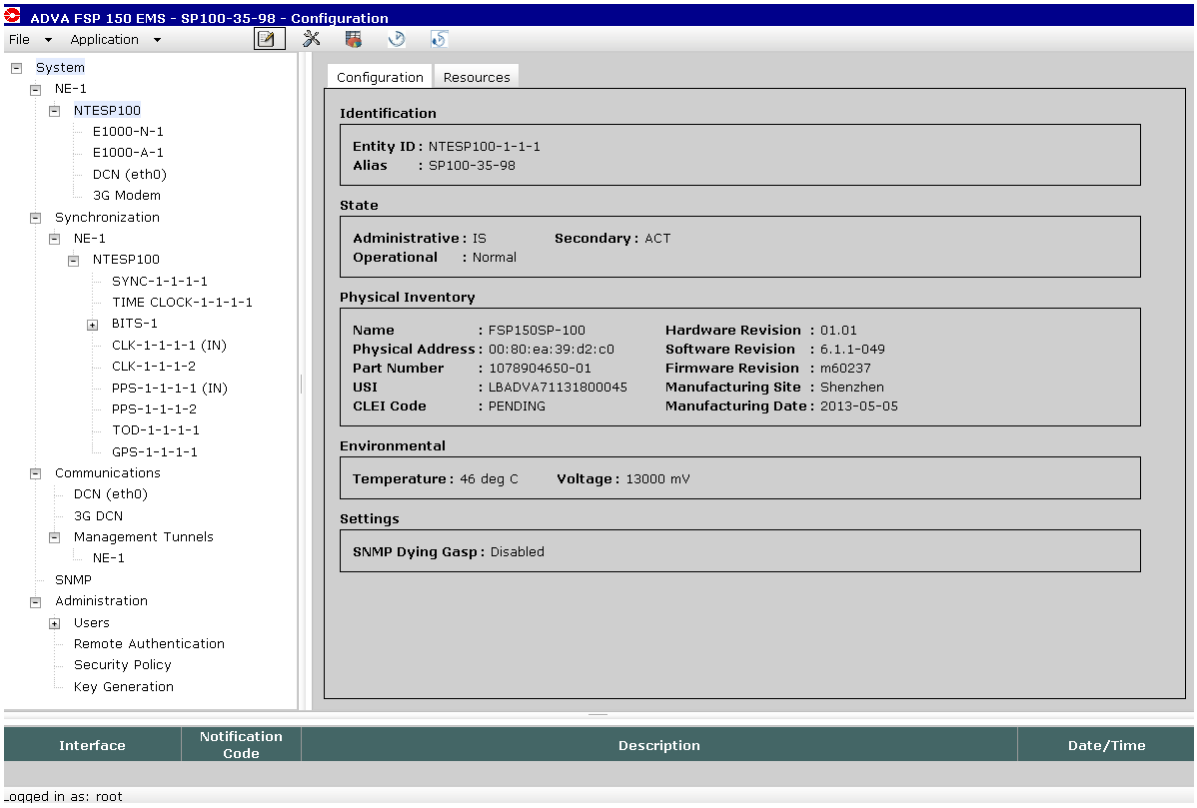
Figure 44: Logged On FSP 150SP



Step 6 Resize the screen for viewing, as desired.

End of Procedure

Logging Off

To log out of the FSP 150SP eVision web browser management tool:

Procedure

Step 1 Select **File**, **Exit** from the Menu Bar.

Step 2 Close the internet browser.

End of Procedure

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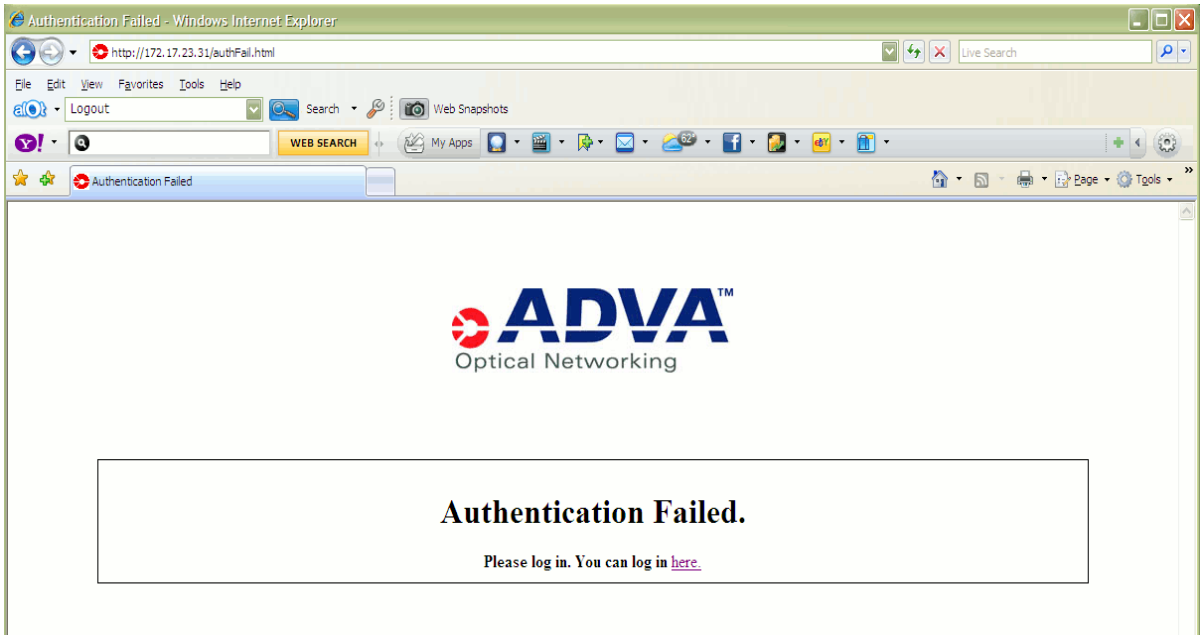
User Session Timeout

Each user is provisioned with a user inactivity timeout of 0 minutes (to disable timeout) to 99 minutes. Default is 15 minutes. Only a Superuser (see “User Authorization Privilege Levels” on p. 436) may edit a user GUI login timeout value. When a user session is inactive for the amount of time provisioned in the GUI timeout, the user session is automatically logged off to ensure system security. Once the user timeout has occurred and the user attempts to operate or view the eVision GUI, an Authentication Failed screen is displayed.



When this occurs, simply select **here** from the Authentication Failed screen to go to the FSP 150SP login screen, and continue with the logon sequence (see Step 3 of “Logging On” on p. 130).

Getting Familiar with eVision

The eVision web browser management tool provides a web based Graphical User Interface (GUI) for Operation, Administration and Maintenance (OAM) functions. The eVision Web Browser Management Tool workspace is arranged to allow you to focus on the task you wish to perform while continually displaying alarm information. The Menu Bar, Tool Bar and Selection Tree provide easy access to the desired workflow, e.g., provisioning an entity or performing maintenance functions.

The Details Pane provides a different set of viewing and editing options depending on the application and entity selected. The Alarms pane provides continuous alarm monitoring regardless of the application currently selected.

The Configuration Application displays when you first open eVision. The FSP 150SP system view (located in the Details Pane) provides a physical representation of the FSP 150SP, its current provisioning configuration and alarm status.

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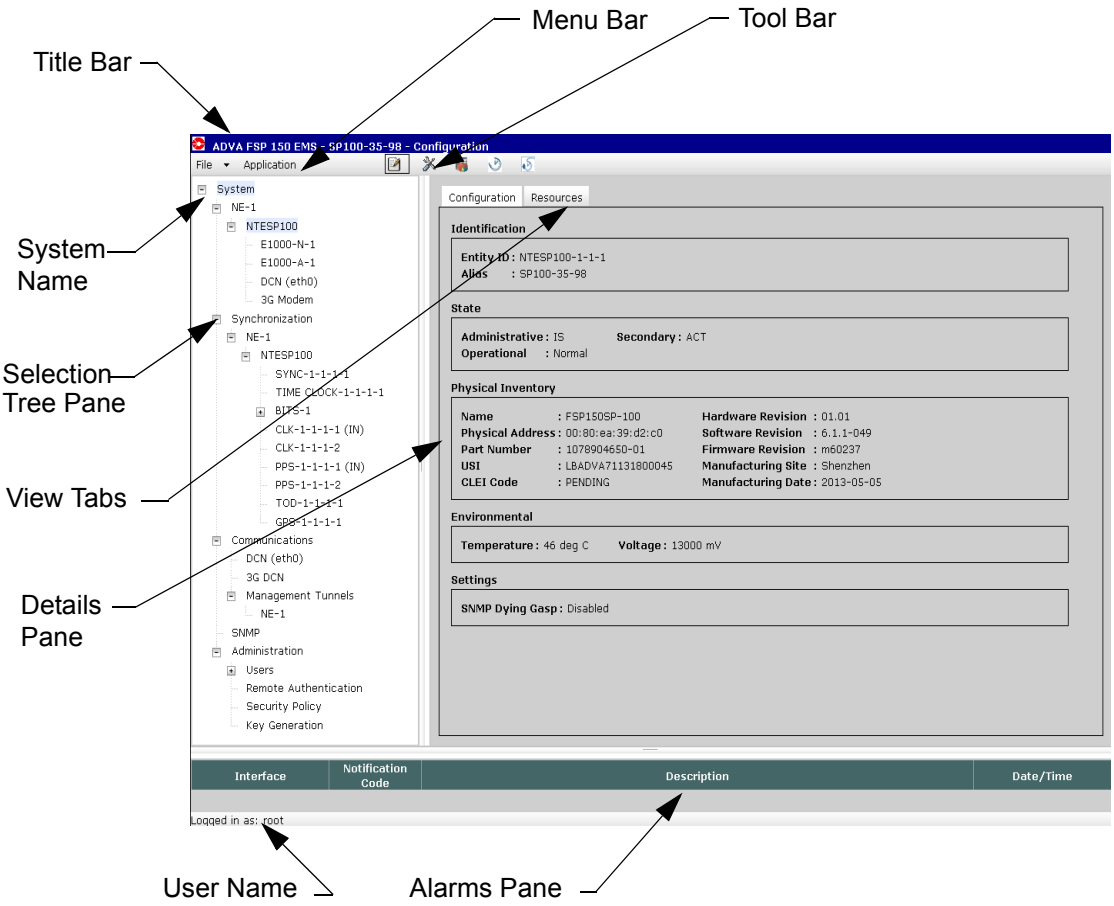
Figure 45: eVision Web Browser Management Tool Components



Alarm details are displayed in the Alarms Pane. Refer to Figure 45 on p. 134 for an example of a system entity selected in Configuration view and each component of the web browser window.

About the Workspace

The eVision workspace consists of the following components.

- Title Bar, on Page 3-135.
- Menu Bar, on Page 3-135.
- Tool Bar, on Page 3-136.
- Selection Tree Pane, on Page 3-137.
- Details Pane, on Page 3-138.
- Alarms Pane, on Page 3-141.

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Title Bar

The Title Bar displays the current application that has been selected from the Menu Bar, Application menu or the Tool Bar.

Menu Bar

Each item on the Menu Bar provides a pull-down menu which contain the menu options available in eVision. Menu options are selected by pointing and clicking with the mouse in the File or Application drop down menu and then clicking the mouse on the desired option.

The menus available on the Menu Bar are:

- **File**, which provides the following options:
  - Logout
- **Application**, which provides the following options:
  - Configuration
  - Maintenance
  - Performance Monitoring
  - PTP
  - SyncJack

Note

The selections available on the **Application** pull-down menu may also be selected from the Tool Bar. See “Tool Bar” on p. 136.

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Tool Bar

The Tool Bar contains a set of tool buttons that can be selected for quick access to eVision applications. The tool buttons available are:

Configuration, which accesses the Configuration application. It allows you to perform provisioning functions, such as editing system, equipment, facilities or users. Various views are provided when Configuration is selected, depending on what entity is selected in the Selection Tree. When entering a right click on a folder or entity from the Selection Tree, provisioning options become available in menu form. Options available to the user are dependent upon the user access permission level.

Maintenance, which accesses the Maintenance application. It allows you to perform maintenance functions, such as loopbacks, diagnostics, software upgrade, database backup and restore. When entering a right click on a folder or entity from the Selection Tree, maintenance options become available in menu form. Various views are provided, depending upon what folder or entity is selected in the Selection Tree. Options available to the user are dependent upon the user access permission level.

Performance Monitoring, which accesses the Performance Monitoring application. It allows you to retrieve performance monitoring counts in columnar or chart format. Performance monitoring thresholds can be edited or displayed, and registers can be initialized (depending on the user access permission level).

Precision Time Protocol (PTP) feature provides the ability to create and monitor End-to-End (E2E) functionality or Telecom Slave (TS) functionality for use in high accuracy time and frequency synchronization applications.

SyncJack feature for monitoring and analyzing clock and synchronization.

Note

The applications available on the Tool Bar, may also be selected from the **Application** pull-down menu on the Menu Bar. See “Menu Bar” on p. 135.

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Selection Tree

The Selection Tree (located at the left of the screen) enables the user to select an entity in order to:

- display a status pane related to that entity (shown in the Details Pane to the right)
- select menu options related to that entity

The Selection Tree provides a hierarchical tree of the entities that make up an FSP 150SP system and the entities related to that system. Each Selection Tree entity is representative of a specific entity type (NE, PSU, Network Port, Access Port, communications, SNMP, administration, etc.).

Entities are arranged in hierarchical order, e.g., to gain access to an Access Port, the System, NE-1 and FSP 150SP menus must first be opened. Selection Tree nested items are opened or closed by clicking on the + or - symbol next to the entity, respectively. Once an entity is opened, the entity item is expanded, displaying nested items.

A “pointing hand” cursor (displayed when hovering the cursor over an entity within the selection tree) indicates there are menu selectable items available for that entity, and if a right mouse click is entered on that entity, applicable menu selectable items appear. See Figure on p. 138 for an example of a Selection Tree with menu selected. Menu selectable items are bold and non-selectable items are grey. If an I-beam cursor is displayed, it indicates there are no menu selectable items for that entity within the currently selected application.

When an entity is selected within the Selection Tree, the corresponding entity status is displayed in the Details Pane. The status displayed in the Details Pane is dependent upon which application is currently selected. For example, if Configuration application is selected, and a Access Port facility is selected in the Selection Tree, facility status information such as assigned state and operational state is displayed. If the same Access Port facility is selected in the Selection Tree while in Maintenance view, the Details Pane will display Etherjack® diagnostics results and alarm attributes.

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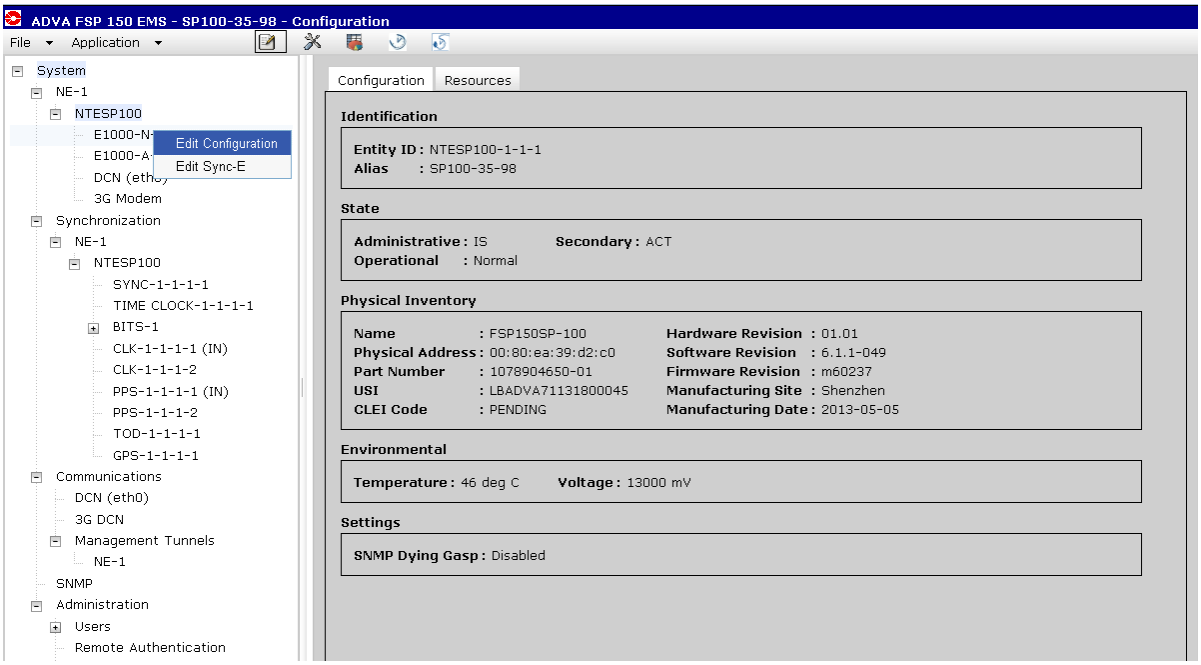
Figure 46: Selection Tree with Menu Selected



Details Pane

When an item is selected from the Selection Tree with the left mouse button (see"Selection Tree" on p. 137), a status view related to that item is displayed in the Details Pane (to the right of the Selection Tree). The details displayed are dependent upon the Application currently selected.

If details are provided by more than one status pane, tabs are provided to toggle between each pane. See Figure 47 on p. 139 for an example of tab selections in the Details Pane.

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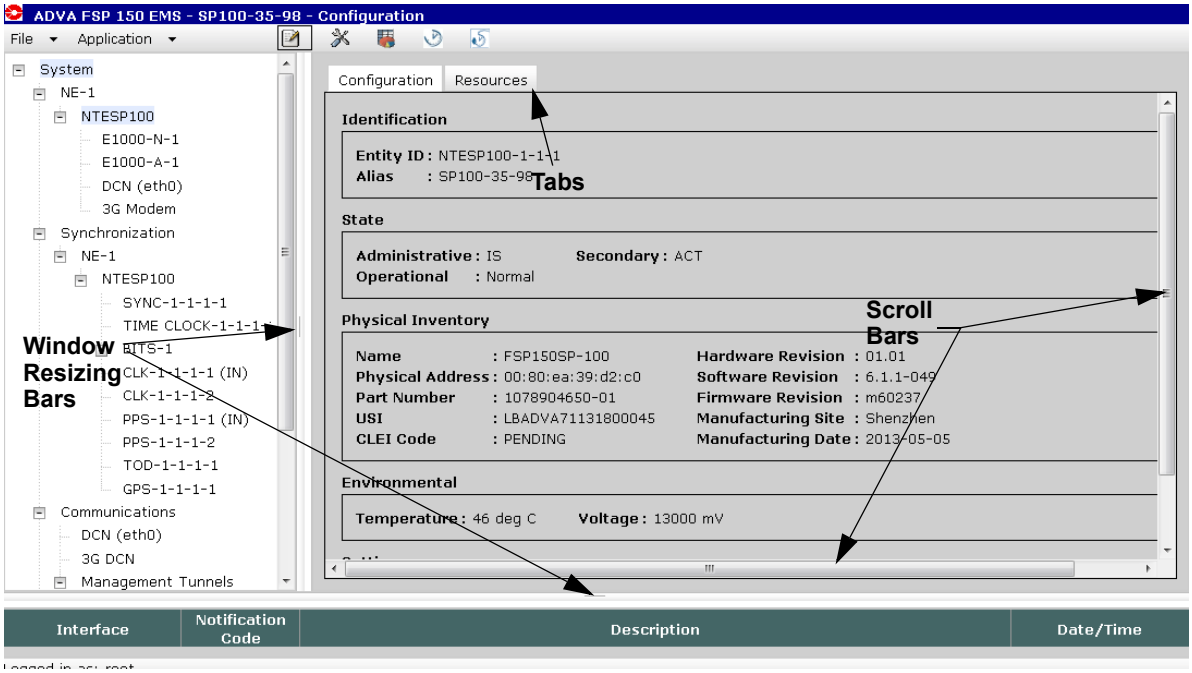
Figure 47: Tab Selections and Scroll Bars in the Details Pane



If data is too large to fit in the current Details Pane size, the browser window can be resized or maximized to view a larger area, you can use the window resizing bars to open the viewing area, or you can use the scroll bars located in the Details Pane to view the remaining data (see Figure 47 on p. 139).

Right clicking on an entity in the Selection Tree Pane opens a window of available edits for that entity selecting one of these yields an edit view in the Details Pane. See Figure 48 on p. 140 for an example of an Edit Access Port pane. Note that all valid provisioning options are displayed in white and options that are not provisionable are grayed out (Media Type).

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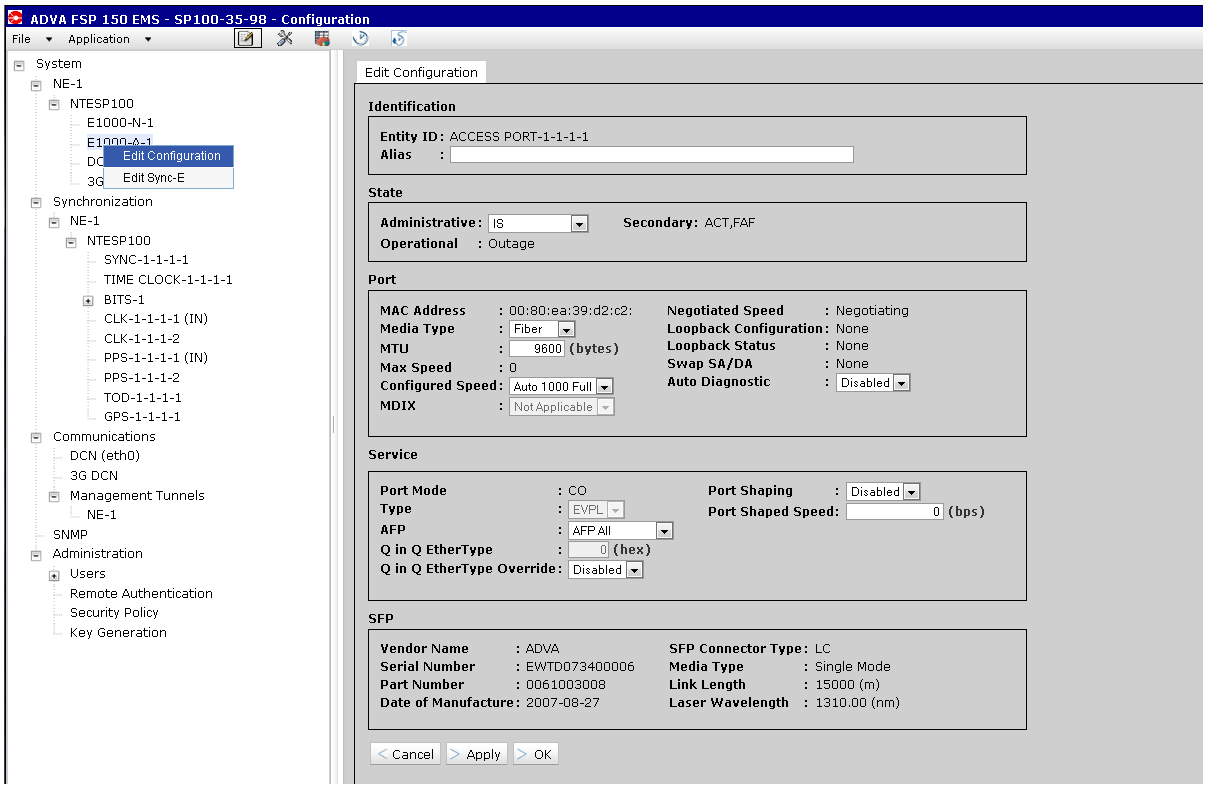
Figure 48: Edit Access Port Pane



The operations and provisioning options in a Details Pane are displayed in a series of fields. The information provided in the Details Pane enables the user to gain information on the operation of the FSP 150SP and to input and/or select data that is required for the desired operation.

Operations and Provisioning Field Types

The field types that may appear on a Details Pane are:

- **Display only fields**, which are provided to display status information. These fields are gray and cannot be selected or changed.
- **Provisionable fields**, which have a white background, are used to indicate:
  - a field that can be edited by direct data input
  - a selectable drop down menu which provides context sensitive provisioning options
  - a check box (or toggle button)
  - a right-click menu of options (configuration files only)

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Command Buttons

Actions are selected via command buttons that are available at the bottom of the Details Pane. The common Command Buttons available on a Details Pane are:

- **OK**, which accepts the information in a status pane and closes the pane.
- **Cancel**, which cancels any changes that have been made to the information in the status pane and closes the pane.
- **Refresh**, which reads and displays the latest values of the fields in the status pane.
- **Apply**, which applies any changes made to the information in the status pane, without closing the pane.
- **Next>**, which opens the next page (screen) of data.
- **<Back**, which opens the previous page (screen) of data.

Alarms Pane

The Alarms Pane provides quick visibility and access to current alarms.

All alarms are color coded by severity:

- red; Critical
- orange; Major
- yellow; Minor

Each alarm is listed as a separate line item, with the following details:

- Interface type
- Notification Code
- Description
- Date/Time stamp

Keyboard Navigation

It is usual for the mouse to be used to navigate the Workspace and select menu options. However, a number of keys on the PC keyboard can be used to navigate around the Menu Bar, the Selection Tree Pane and the Details Pane as outlined in the table below.

Key	Function
In the eVision Workspace:	
Tab	**Move through Workspace areas**. This key enables the user to move through the Menu Bar, the Tool Bar, the Selection Tree Pane and the Details Pane.
In the Menu Bar:	
Return	**Select**. This key enables the user to display a pull down menu and select a menu option.

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Key	Function
Right arrow Left arrow	**Move**. These keys enable the user to move through the options on the Menu Bar to highlight the one required.
Up arrow Down arrow	**Move**. These keys enable the user to move up and down (scroll) through menu options on a pull down menu to highlight the one required.
In the Selection Tree Pane:	
Return	**Select**. This key enables the user to select a highlighted item or menu option and open the appropriate pane in the Details Pane.
Up arrow Down arrow Tab	**Move**. These keys enable the user to move up and down (scroll) through items and menu options to highlight the one required.
Right arrow	**Open**. This key enables the user to view nested items. If nested items are available it is indicated by a plus sign (+) to the left of that item.
Left arrow	**Close**. This key enables the user to close a nest of items. A minus sign (-) to the left of an item indicates that the item's nested items are open.
In the Details Pane:	
Return	**Select**. This key enables the user to select a highlighted field for information input or a highlighted command button.
Right arrow Left arrow	**Move through status pane tabs**. This key enables the user to navigate through tabs at the top of the Details Pane.
Tab	**Move through editable fields**. This key enables the user to move down through the editable fields and the command buttons on a status pane.
Up arrow Down Arrow	**Move through the options of a drop down list**. This key enables the user to move up or down through the items of a drop down list.

eVision Applications

The eVision web browser management tool provides the user with the following major applications:

- Configuration
- Maintenance
- Performance Monitoring
- PTP
- SyncJack

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Each of the Applications can be selected from the Menu Bar (see “Menu Bar” on p. 135) or the Tool Bar (see “Tool Bar” on p. 136). The Title Bar displays the latest application that has been selected (see “Title Bar” on p. 135).

Configuration View

Configuration view allows you to perform provisioning functions, and view provisioning attributes of the entity that is selected in the Selection Tree or the entity Details Pane. Left clicking an item in the Selection Tree displays current status and configuration in the Details Pane. Right clicking an item in the Selection Tree displays a selection window for editing configuration items for the selected entity. Selecting an editing option brings up an edit view in the Details Pane. Alarm status is displayed in the Alarms Pane located at the bottom of the screen, providing constant visibility and access to current alarms. Options available are dependent upon the user access permission level and the current entity status.

For procedures regarding provisioning of specific entities, refer to Chapter 4, “Operations Provisioning” on p. 153.

The following configuration changes can be applied and current status can be viewed within Configuration View:

System

System level settings can be viewed by selecting the System entity in the selection tree. Additional system level settings may be viewed by selecting one of the following tabs: Identification, Security Log, Alarm Log, Audit Log, Syslog, ACL (Access Control List), Banner or NTP (Network Time Protocol). You can edit system options by entering a right click on the System entity and selecting the desired menu option. System Defaults may also be restored at this menu level.

Network Element (NE)

NE level settings can be viewed by selecting the NE-1 entity in the selection tree. Expanding the NE-1 entity reveals all equipment associated with the NE.

By expanding the NE-1 entity under the System entity, selecting the NTESP100 entity and then selecting the Resources tab of the NTESP100 entity, all allocated and available system traffic resources are displayed (see Figure 49 on p. 144).

Network Port, Access Port, DCN, and 3G Modem provisioning may be performed within the NE-1 hierarchy in the selection tree.

See Figure 50 on p. 144 for an example of an Edit Network Port Configuration view.

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Figure 49: NTESP100 Resources Tab

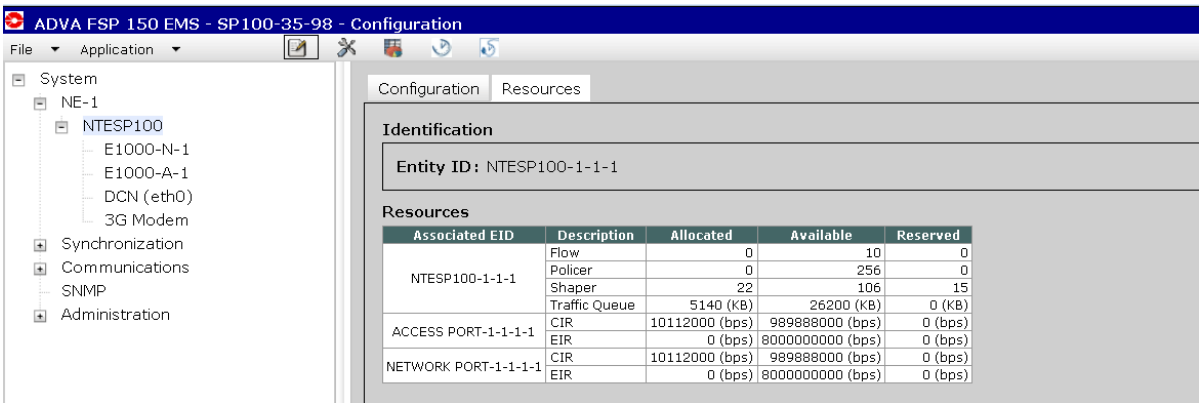
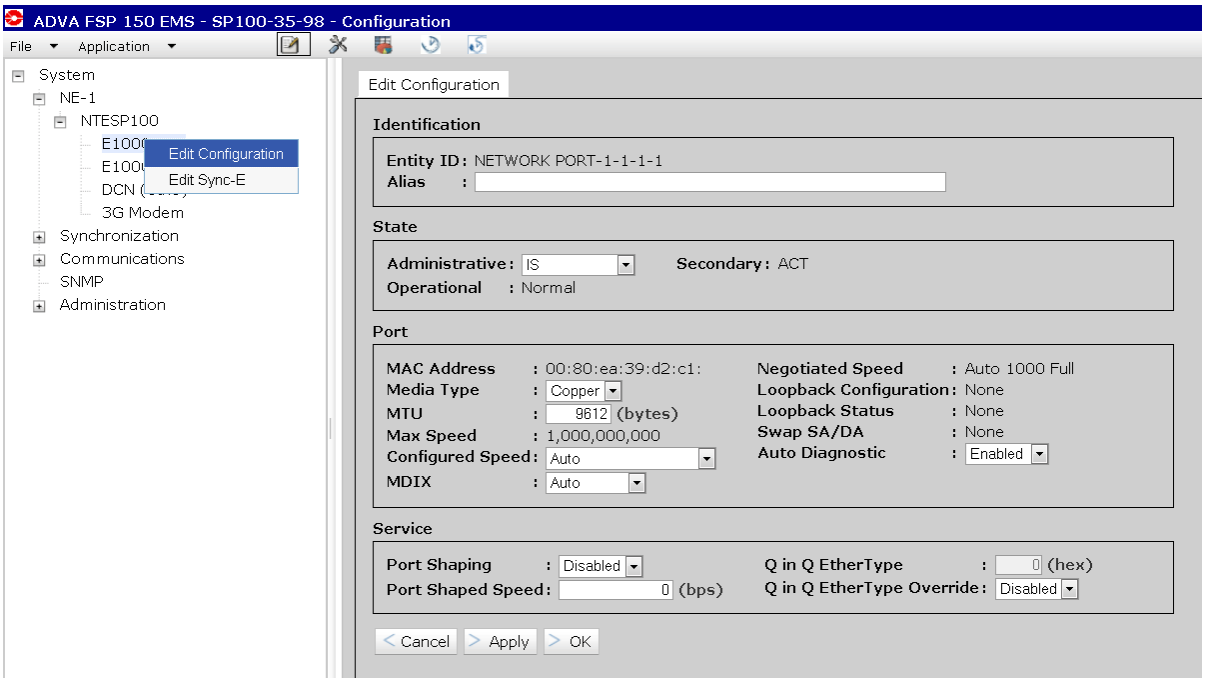


Figure 50: Edit Network Port Configuration View



Synchronization

By expanding the Synchronization and NE-1 entities, and then selecting the SYNC-1-1-1-1 entity, the current Network Clock Type is displayed. Entering a right click allows editing network synchronization administration state and clock type, or synchronization reference source. Select the Status tab to display the current synchronization status, including any user requests or synchronization reference list status.

By expanding the NTESP100 and BITS-1 entities, and then selecting the BITS-IN or BITS-OUT entity, the current configuration and received/transmit quality level is displayed. Similarly, selecting the CLK (10MHz Clock), PPS (Pulse Per Second Clock), TOD (Time Of Day) or GPS (Global Positioning Sat-

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ellite) entities allows viewing the current configurations. Entering a right click allows editing the synchronization administration state and configuration settings.

Communications

Static Routes, Static ARP Entries and Source Address Configuration are viewed by selecting the Communications entity and selecting the associated tab. Static Routes and Static ARP Entries may be added or deleted, and Source Address Configuration may be edited by entering a right click on the Communications entity.

The DCN (eth0) entity, or the 3G DCN (Modem) entity is accessed by expanding the Communications entity and management tunnels are accessed by expanding the Management Tunnels and NE-1 entities. These entities are provisioned by expanding the Communications entity, entering a right click on the desired entity in the selection tree and selecting the applicable menu option.

SNMP

Simple Network Management Protocol (SNMP) Communities, Target Addresses, Target Parameters, User-based Security Model (USM) User entries and SNMP Dying Gasp are viewed by selecting the SNMP entity and selecting the associated tab in the Details Pane. These entities are provisioned by entering a right click on SNMP in the selection tree and selecting the applicable menu option.

Administration

Users, Remote Authentication, Security Policy and Key Generation are viewed by expanding the Administration entity and selecting the entity in the selection tree. These entities are provisioned by expanding the Administration entity, entering a right click on the desired entity in the selection tree and selecting the applicable menu option.

Maintenance View

Maintenance View allows performing maintenance functions, such as diagnostics, loopbacks, raising and clearing test alarms, setting and retrieving alarm attributes, rebooting, upgrading software, database backup and restore and configuration file management.

When entering a right click on an entity in the Selection Tree, maintenance options are available in menu form. The options available are dependent upon the user access permission level and current entity status. Alarm status is displayed in the Alarms Pane at the bottom of the screen, providing constant visibility and access to current alarms.

For more information on Maintenance operations, refer to Chapter 4, “Operations Provisioning” on p. 153 and Chapter 6, “Etherjack/Syncjack Test Procedures, and Performance Monitoring” on p. 319.

The current status is viewed and maintenance operations performed within Maintenance View:

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System

Selecting the System entity allows viewing of System Identification and Conditions List.

Network Element (NE-1)

Selecting the NE entity allows viewing the conditions list associated with the NE. Expanding the NE entity reveals all equipment associated with the NE. Entering a right click on the NE-1 entity provides a menu option for performing a lamp test. The following maintenance functions may be viewed/performed for the following entities when the NE is expanded in the selection tree:

- NTESP100
  - NTESP100 - Entering a right click provides menu options for raising and clearing test alarm, and rebooting the NTESP100.
  - Network port - view operations status, diagnostic results and cable benchmarks. Entering a right click provides menu options for performing Loopbacks and raising/clearing a test alarm.
  - Access port - view operations status, diagnostic results and cable benchmarks. Entering a right click provides menu options for raising and clearing test alarm, and performing Loopbacks.

Synchronization

By expanding the Synchronization entity, the NE-1 entity, the NTESP100 entity and selecting the SYNC entity or Time Clock entity, the Configuration and Status tabs for SYNC / Time Clock are displayed. Entering a right click on the SYNC / Time Clock entity allows switching Sync references. The operations available are:

- Forced Switch
- Manual Switch (Sync only)
- Lock Out
- Clear Wait To Restore
- Clear Lock Out
- Clear Switch

Communications

Selecting the Communications entity allows viewing of the Routing Table, ARP Table, the results of the last ping command, and the results of the last trace route command. Ping, Trace Route and Flush ARP Cache options are available when a right click is entered on the Communications entity.

Alarm Attributes

By expanding the Alarm Attributes and selecting a listed entity the current alarm attribute settings for that entity are displayed. Entering a right click on the entity allows editing the alarm severity of each listed condition. The NE entities available for viewing and editing in Maintenance View are:

- 10Mhz (CLK) Port

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- 3G USB MODEM
- Access Port
- BITS In Port
- BITS Out Port
- Clock Probe
- DCN Port
- GPS Port
- Network Port
- PTP Clock Probe
- PTP Network Probe
- Pulse Per Second (PPS) Port
- SOOC
- NTESP100 Card
- NTESP100 Shelf
- Synchronization
- System
- Telecom Slave
- Time Clock
- Time of Day (TOD) Port

Administration

Expanding the Administration entity reveals the Software, Database, Configuration Files and Software Licensing entities. The following maintenance functions are available:

- **Administration** - Right clicking on the Administration entity allows selection of Restore System Defaults or Restore Factory Defaults. See "Restore System Defaults" on p. 252 and "Restore Factory Defaults" on p. 253 for explanations of these operations and the difference between them.
- **Upgrade** - Selecting the Upgrade entity displays the current Active and Standby software versions along with the File Services mode and status and the Validation Timer status. Entering a right click on the Upgrade entity allows selection of Transfer, Install, Activate and Validate options.
- **Database** - Selecting the Database entity displays the current Active and Standby database versions along with the File Services mode and status. Entering a right click on the Database entity allows selection of database backup and restore functions: Backup Database, Copy to Remote, Copy from Remote, Restore Database and Activate Database.
- **Default Database** - Entering a right click on the Default Database entity allows selection of the Save (create a new default database), Copy to Remote, Copy from Remote, and New (revert the default database back to factory defaults).

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- **Default Settings** - Selecting the Default Settings entity allows the copying of a remote default value file to the FSP 150SP via Web, FTP, SCP or SFTP.
- **Configuration Files** - Selecting the Configuration Files entity displays the current list and status of the configuration files resident on the unit. Entering a right click on the Configuration File entity allows the user to Create a new configuration file, or Copy from Remote. Entering a right click on a configuration file in the table in the details pane yields a list of configuration file options including: Save, Edit Description, Copy to Remote, Restart with File and Remove.
- **Last Reset Cause** - Selecting the Last Reset Cause entity displays the Last Reset Type and Last Reset Cause information along with identifiers for up to three debug files if any exist. Entering a right click on the Last Reset Cause entity allows the user to Copy to Remote the debug file(s).
- **Transfer Log** - Entering a right click on the Transfer Log entity allows the user to select the desired log (Alarm, Audit or Security) to transfer.
- **Software Licensing** - Features such as SyncJack Extended Scaled may be enabled or disabled by expanding the Software Licensing entity, entering a right click on Feature Management and selecting Edit Feature.

Viewing Entities in Maintenance View

When selecting an entity in Maintenance View, Alarm Attributes views are available by selecting the associated entity in the view area under the Alarm Attributes heading. Selecting the entity displays the current Notification Code (NC) assigned to each Alarm Attribute/Condition Type (see Figure 51 on p. 149).

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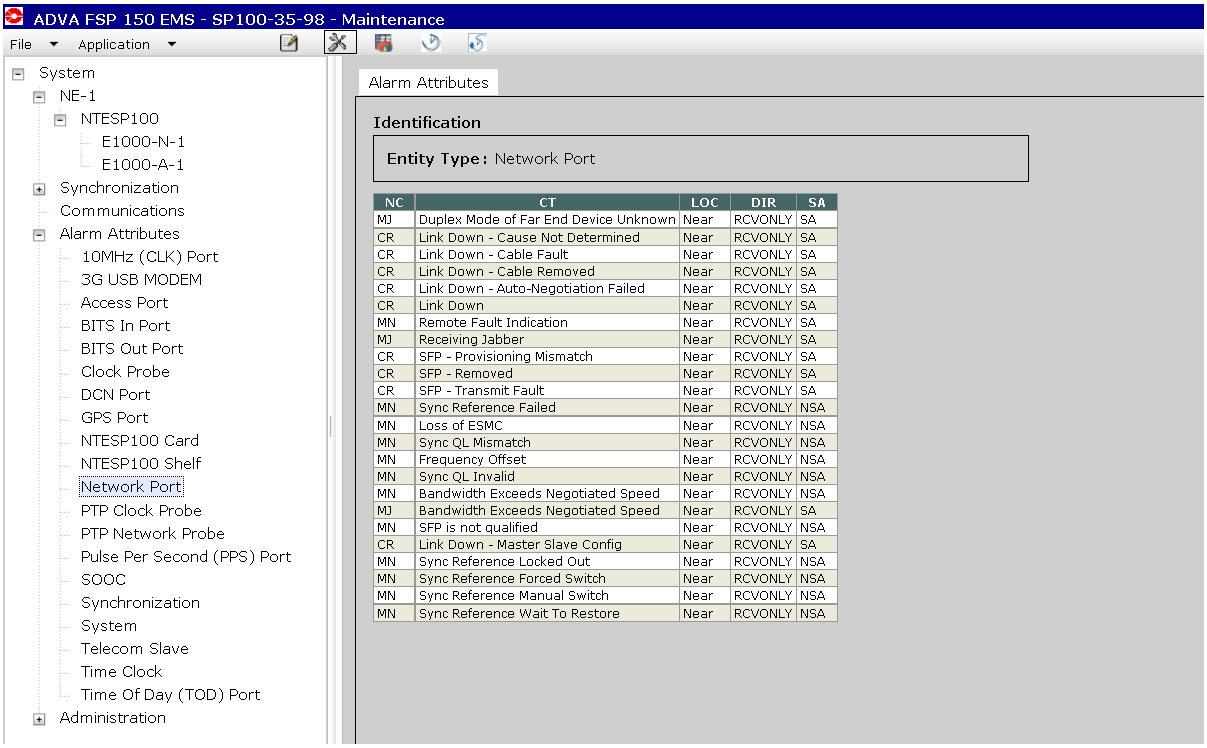
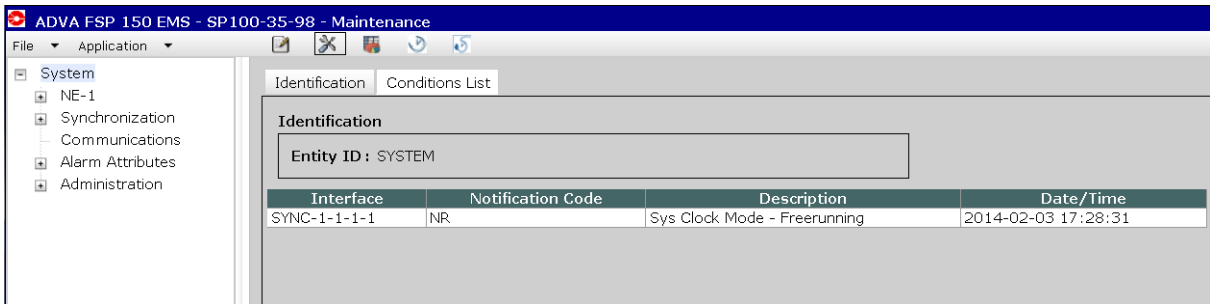
Figure 51: Alarm Attributes View of a Network Port


ADVA FSP 150 EMS - SP100-35-98 - Maintenance
File
Application
System
NE-1
NTESP100
E1000-N-1
E1000-A-1
Synchronization
Communications
Alarm Attributes
10MHz (CLK) Port
3G USB MODEM
Access Port
BITS In Port
BITS Out Port
Clock Probe
DCN Port
GPS Port
NTESP100 Card
NTESP100 Shelf
Network Port
PTP Clock Probe
PTP Network Probe
Pulse Per Second (PPS) Port
SOOC
Synchronization
System
Telecom Slave
Time Clock
Time Of Day (TOD) Port
Administration
Alarm Attributes
Identification
Entity Type: Network Port
NC CT LOC DIR SA
MJ Duplex Mode of Far End Device Unknown Near RCVONLY SA
CR Link Down - Cause Not Determined Near RCVONLY SA
CR Link Down - Cable Fault Near RCVONLY SA
CR Link Down - Cable Removed Near RCVONLY SA
CR Link Down - Auto-Negotiation Failed Near RCVONLY SA
CR Link Down Near RCVONLY SA
MN Remote Fault Indication Near RCVONLY SA
MJ Receiving Jabber Near RCVONLY SA
CR SFP - Provisioning Mismatch Near RCVONLY SA
CR SFP - Removed Near RCVONLY SA
CR SFP - Transmit Fault Near RCVONLY SA
MN Sync Reference Failed Near RCVONLY NSA
MN Loss of ESMC Near RCVONLY NSA
MN Sync QL Mismatch Near RCVONLY NSA
MN Frequency Offset Near RCVONLY NSA
MN Sync QL Invalid Near RCVONLY NSA
MN Bandwidth Exceeds Negotiated Speed Near RCVONLY NSA
MJ Bandwidth Exceeds Negotiated Speed Near RCVONLY SA
MN SFP is not qualified Near RCVONLY NSA
CR Link Down - Master Slave Config Near RCVONLY SA
MN Sync Reference Locked Out Near RCVONLY NSA
MN Sync Reference Forced Switch Near RCVONLY NSA
MN Sync Reference Manual Switch Near RCVONLY NSA
MN Sync Reference Wait To Restore Near RCVONLY NSA

A Conditions List is also present for the NE-1 entity (see Figure 52 on p. 149).

Figure 52: Conditions List View of the NE-1 Entity



Editing Alarm Attributes

An Edit Alarm Attributes pane is accessed in Maintenance view by entering a right click on an entity under Alarms Attributes and selecting **Edit Alarm Attributes** (see Figure 53 on p. 150). Notification Codes can be edited for a given Condition Type by selecting the desired Notification Code in the drop down menu, selecting the desired Notification Code, then selecting **Apply** or **OK**.

Notification Codes available for selection are:

- Critical (CR)

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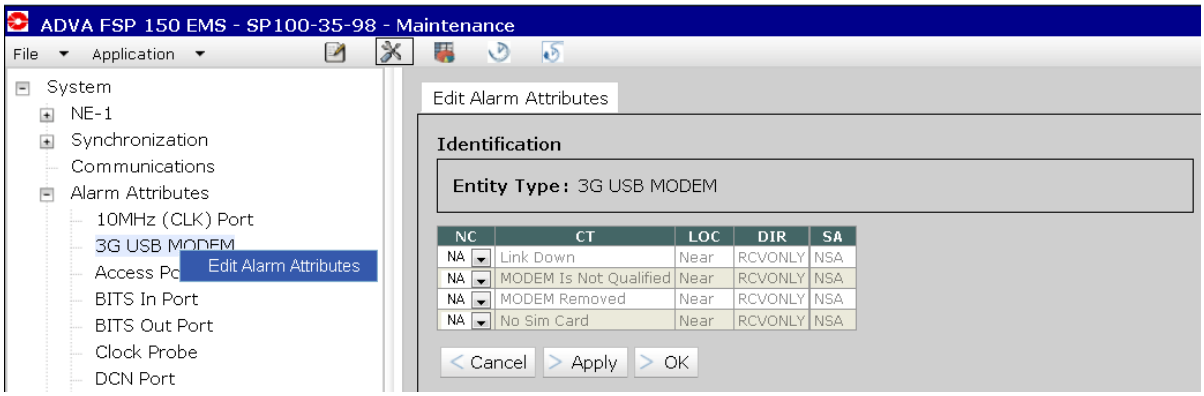
- Major (MJ)
- Minor (MN)
- Not Alarmed (NA)
- Not Reported (NR)

Figure 53: Edit Alarm Attributes Pane



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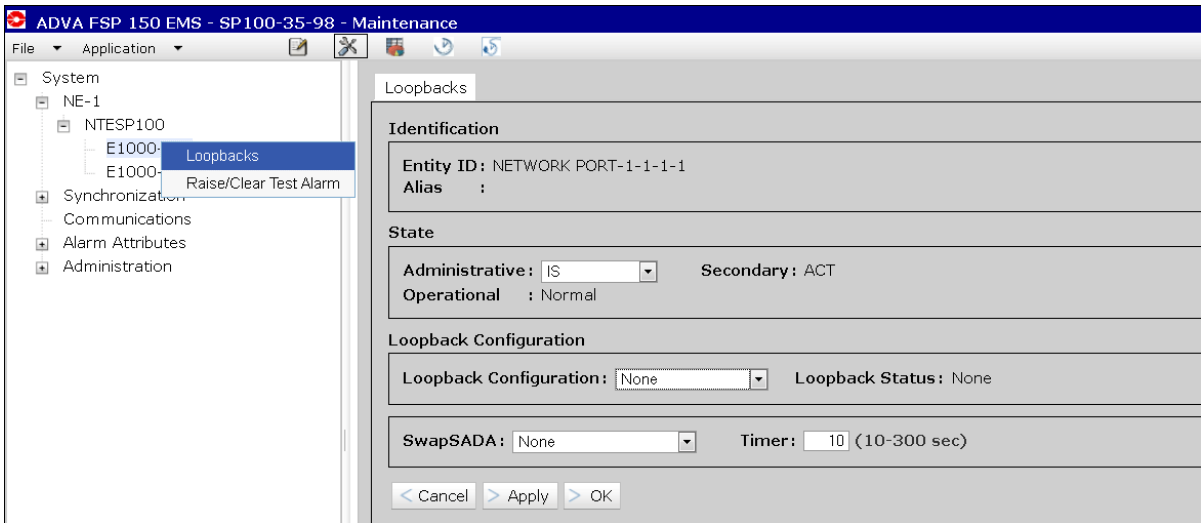
Loopbacks

Entering a right click on a Network Port or Access Port under the NTESP100 entity and selecting **Loopbacks** provides a Loopback view. From this view, the Network Port or Access Port entity can be placed in the Maintenance state, and a loopback can be performed.

See the following figure for an example of a loopback view. For loopback procedures, see Chapter 6, “Etherjack/Syncjack Test Procedures, and Performance Monitoring” on p. 319.

When using eVision, to remove a loopback, click on the drop-down list for Loopback Configuration and select “None”, then click on “OK”.

Figure 54: Loopback View



Performance Monitoring View

See “Network/Access Port Performance Monitoring” on p. 321.

Precision Time Protocol

See “Provision Precision Time Protocol (PTP)” on p. 208.

SyncJack

See “SyncJack Testing” on p. 344.

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Chapter 4

Operations Provisioning

Introduction

This chapter contains system provisioning details for the SP-100 and provides a recommended work flow for new installations. The procedures can also be used for incorporating provisioning changes to existing systems. Additionally, this chapter includes links to technical information and procedures elsewhere in the document that are needed or helpful in successfully completing the installation and original provisioning process.

Provisioning the SP-100

Once the chassis has been installed, cabled and powered (see “Physical Installation” on p. 73), it requires provisioning and testing prior to carrying customer traffic. The procedures to accomplish this are listed below in the suggested order that they be performed. The following sections can also be used for incorporating provisioning changes to existing systems.

Recommended Sequence of Steps for Initial Turn Up of an SP-100

The following sections in this chapter provide supporting information and procedures for provisioning the SP-100:

- “Serial Connection” on p. 276
- “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276
- “Browser-based IP Connection” on p. 285
- “Upgrade Software Version” on p. 154
- “Provision System Options” on p. 162
- “Provision NE-1 Common Units” on p. 169

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- “Provision Secure Access” on p. 171
- “Provision SNMP Access” on p. 181
- “Provision Access Port” on p. 181
- “Provision Network Port” on p. 184
- “Provision Synchronization” on p. 186
- “Enable Software Licensing for SyncJack / PTP Feature(s)” on p. 206
- “Provision Precision Time Protocol (PTP)” on p. 208
- Provision SyncJack see (“SyncJack Testing” on p. 344)
- Clear all alarms (see “Recommended Steps for Trouble Clearing” on p. 381)
- “Create a Database Backup” on p. 244
- “Test the FSP 150SP” on p. 271:
  - Network/Access Port Loopbacks
  - Network/Access Port Performance Monitoring

Upgrade Software Version

Upgrading or changing the system software is a multi-step process:

- First, the new software is transferred from an external repository to a temporary location on the NE. The NE supports transfer via HTTP (Web), HTTPS (Web), FTP, SFTP and SCP protocols.
- Second, the new system software is installed, that is transferred to the standby side of the NE.
- Third, the new software is activated, that is switched from standby to active. The SP-100 supports immediate or scheduled activation and can use a validation timer, which allows the NE to revert to the previous software version if problems are encountered during the software upgrade process.
  - If scheduled activation is chosen, it is possible to cancel the activation any time before the activation occurs.
  - If validation timing is set, the user must accept the new load by the time set, or the NE automatically reverts to the previous load.

Note

It is recommended to perform a refresh of the browser after every SW upgrade. Any resource that is cached by the browser may have to be refreshed if that resource is different from one release to another.

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Activation causes the NE to reset, which temporarily interrupts traffic and cancels all active user sessions

. During the software upgrade process, it is desirable to know the status of the upgrade. The SP-100 provides standing conditions to supply this need. By default, these conditions are set with a Notification Code of Not Reported and thus are only visible by selecting the Maintenance Application System view and selecting the Conditions List tab in the Details Pane.

Note

If the user wants to see the status conditions dynamically while using the Upgrade or Database detail views, edit the Notification Codes for SWDL and Data Base Condition Types to Not Alarmed. This causes the conditions to display in the Alarm Pane at the bottom of the GUI window. See Table 20 on p. 155.

Also, eVision does not show the settings for Scheduled Activation or Validation Timer once these settings are made. However, the data is included in the Audit Log, which is viewable from the System Details Pane in the Configuration View. Below is a sample of these messages - this example indicates the activation is scheduled for June 17, 2013 at 12:10, with the validation timer set for 1 hour.

```
2013-06-16 00:00:00:root:EVT:2013-06-17 12:10:Software
Activate timer set
2013-06-16 00:00:00:root:EVT:2013-06-17 13:10:Software
Validate timer set
```

Table 20: Software Download Condition Types

Condition Type	Description
SWDL - File Transfer In Progress	Software is being copied from a remote source to temporary memory
SWDL - Installation In Progress	Software is being written from temporary memory to Standby
SWDL - Activation In Progress	Software is being activated or is scheduled for future activation
SWDL - Validation In Progress	Software has been activated and the validation timer was set and is running

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The following procedure includes steps for performing the software upgrade process using the eVision tool. It is also possible to perform this process using CLI. See the *FSP 150SP-100 Command Line Reference Guide* for details. The following procedure also assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN. (See Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port, on Page 5-276.)

Procedure

Step 1 Click on the Maintenance icon, or select “Maintenance” from the application drop-down list.

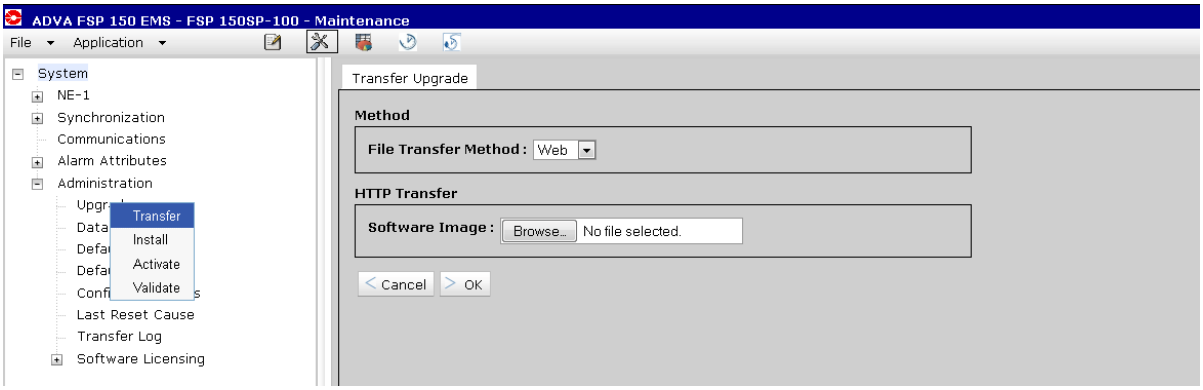
Step 2 Determine the next step.

Desired Activity	Then
Perform Software Upgrade?	Continue with the next step.
Cancel scheduled activation?	Go to Step 16.
Accept or reject upgrade during validation period?	Go to Step 14.

Step 3 Expand “System”, “Administration”, right click on “Upgrade” and select **Transfer**.

The default display is the Web file transfer view, shown below:

Figure 55: Transfer Upgrade - Web View



Step 4 Determine the next step.

Desired Activity	Then
Use Web Browser (HTTP) to transfer software?	Continue with the next step.
Use FTP, SFTP or SCP to transfer software?	Go to Step 7

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Step 5 Enter the path to the proper image file (.img file extension) or use the “browse” button to search for the file location and select it, then select **OK**.

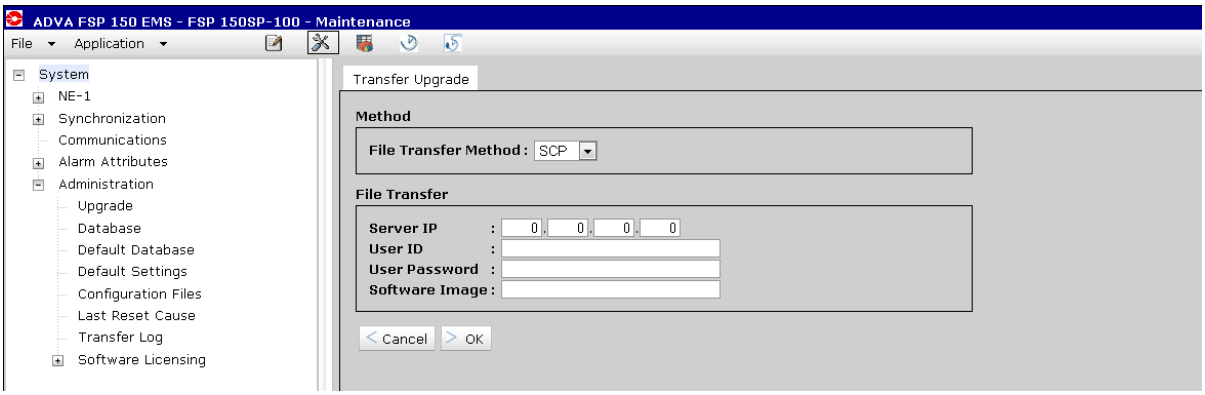
The file transfer will begin, and a screen similar to Figure 57 on p. 158 displays.

Step 6 Go to Step 9.

Step 7 For “File Transfer Method” select FTP, SFTP or SCP from the drop-down list.

The display changes to the FTP, SFTP or SCP file transfer view, shown in the following figure. (The figure shows the SCP view, the FTP and SFTP file transfer view is identical.)

Figure 56: Transfer Upgrade - SCP View



Step 8 Enter the data required in the screen to access the FTP or SCP server and begin the file transfer process, and click on **OK**.

Note

It is assumed that the user knows the IP address of the FTP, SFTP or SCP server, has a valid user ID and password and knows the path and file name of the software file to transfer.

The file transfer will begin, and a screen similar to the following displays:

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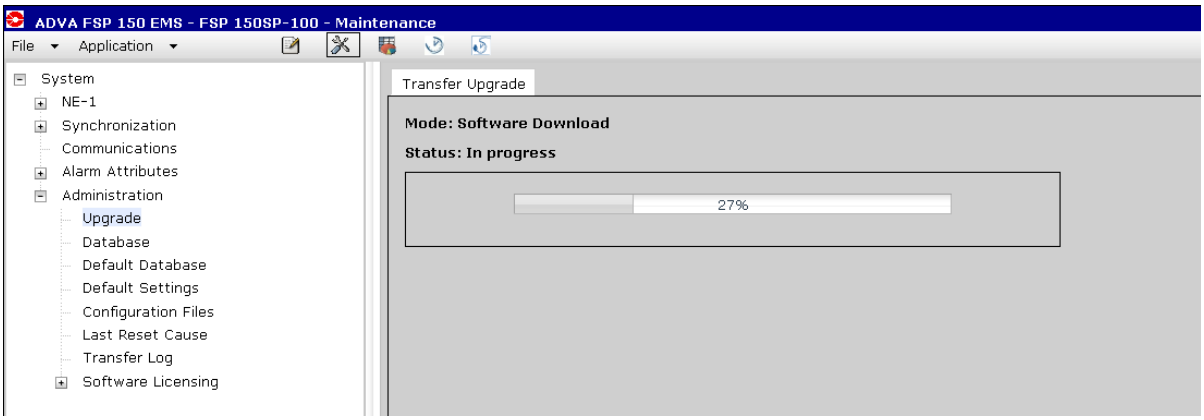
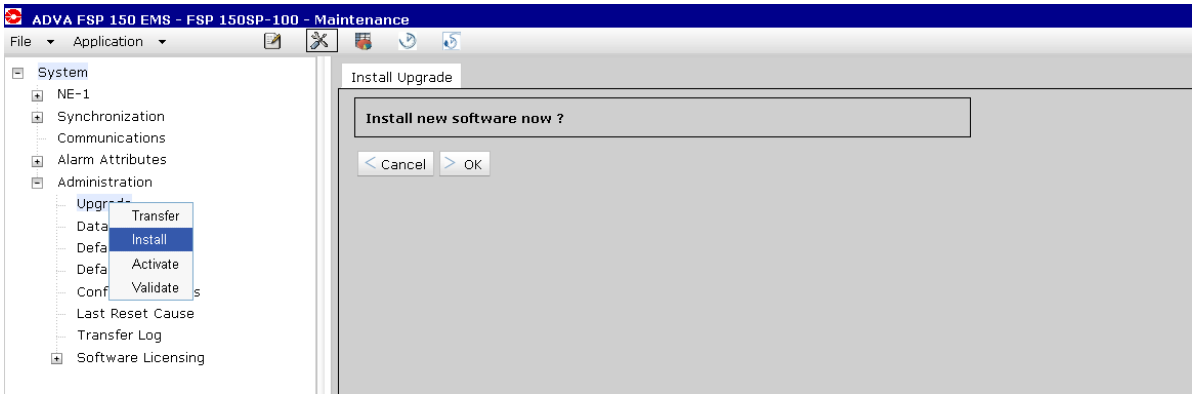
Figure 57: File Transfer Progress Screen



Step 9 When the “Status” changes from “In progress” to “Success”, right click on “Upgrade” in the selection tree pane and select **Install**. The following screen displays:

Figure 58: Software Install Query



Step 10 Click OK, and the screen shows a progress bar. When the install completes (when the “Status” changes from “In progress” to “Success”), right click on “Upgrade” in the selection tree pane, then select **Activate**. An Activate Upgrade screen displays, as shown in the following figure:

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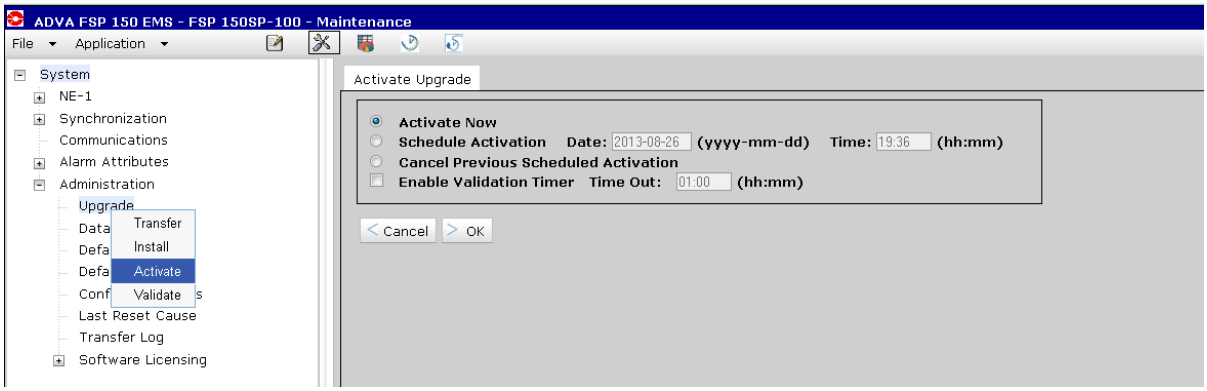
Figure 59: Software Activate



Step 11 Select the activation mode (Activate Now or Schedule Activation).

If Schedule Activation is selected, enter the date and time activation should occur.

Enable and set the validation timer time out option if desired (see the following note and warning).

Note

Activation can be done immediately (Activate Now) or scheduled for some date/time in the future (Schedule Activation). Either way, setting the validation timer causes an automatic switch-back to the previous load if the timer should expire. The validation timer should be set for a long enough period to allow reconnection to the NE and verification that it is functioning properly. Once this “sanity test” is done, the user accepts or cancels the upgrade (see Step 15).

CAUTION

Do not power down the unit while upgrade is in progress. Software and/or database corruption may result.

CAUTION

Failure to use the validation timer option can result in loss of contact with the NE and interruption of customer traffic should the software or database become corrupted during the upgrade process. The validation timer option permits the NE to “roll back” to the previous software and database without user intervention.

CAUTION

Normally, a software upgrade activation is implemented with a warm restart, which is non-service affecting. However, if the upgrade includes FPGA changes, the upgrade is implemented with a cold restart, which does cause a traffic hit. The upgrade release notes include information regarding whether the upgrade is implemented with a warm or cold restart.

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After selecting and setting the activation and validation settings, select **OK**.

Step 12 When activation occurs (now or when scheduled) the NE resets, and the eVision session is interrupted.

Wait for 2 or 3 minutes, then reconnect to the NE. Once logged back in, verify that the NE is behaving normally.

Note

If unable to login, the validation timer will eventually time out and the NE will revert to the previous load, and after that NE reset, reconnection should be possible. If the validation timer was not used, contact technical support.

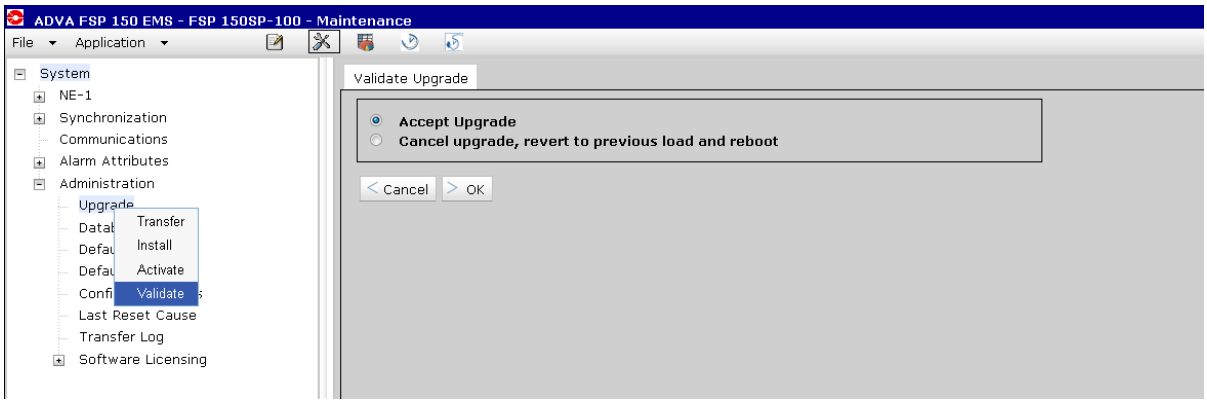
Step 13 Determine the next step.

Desired Activity	Then
Accept or reject upgrade during validation period?	Go to Step 14.
Cancel scheduled activation?	Go to Step 16.
Validation timer not set?	End of Procedure.

Step 14 Expand “Administration”, right click on “Upgrade” and select **Validate**.

The display is the Validate Upgrade view, shown in the following figure:

Figure 60: Validate Upgrade View



Step 15 To accept the upgrade, ensure the radio button next to “Accept Upgrade” is selected.

To cancel the upgrade, ensure the radio button next to “Cancel Upgrade” is selected.

Click on **OK**.

End of Procedure

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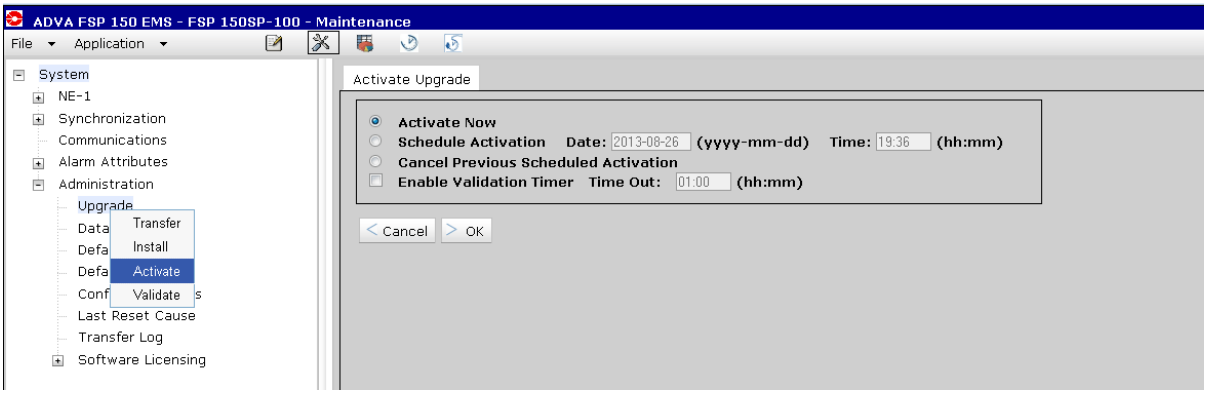
Step 16 Click on “Upgrade” in the selection tree pane, then select **Activate**. An Activate Upgrade screen displays, as shown in the following figure.

Figure 61: Software Activate



Step 17 Select the “Cancel Previous Scheduled Activation” radio button and Click **OK**.

End of Procedure

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Provision System Options

All System options are provisioned using the Configuration application by clicking on the Configuration icon, or selecting “Configuration” from the application drop-down list.

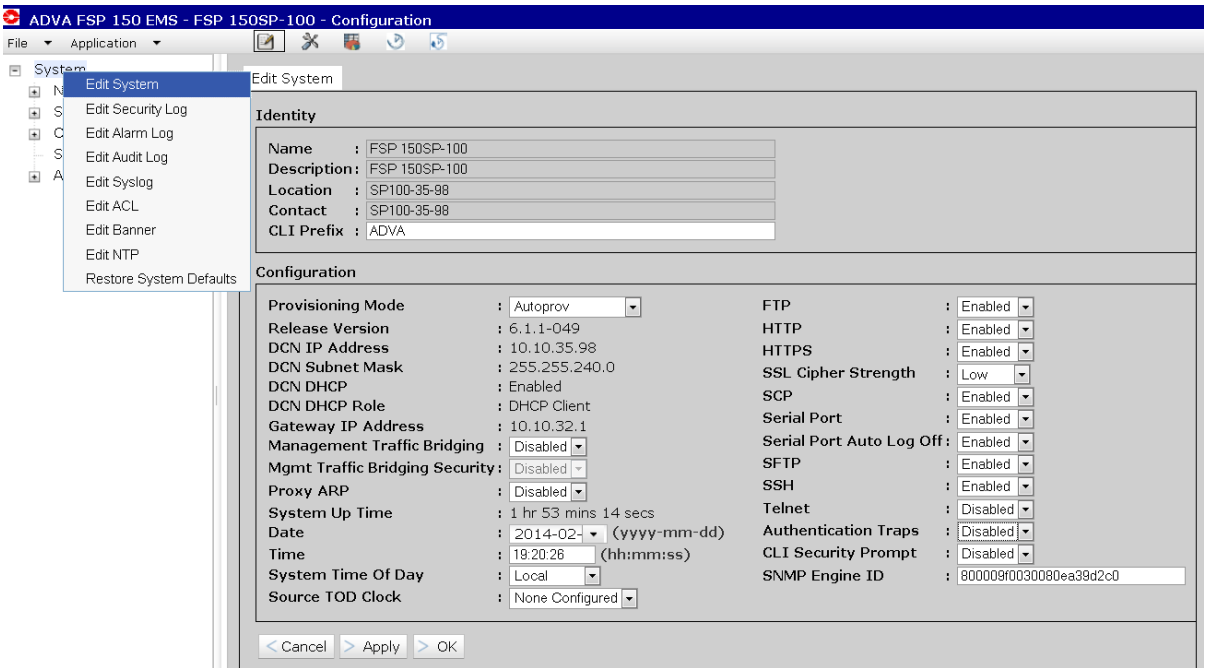
Configure System Identity and Configuration

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 Right click on “System” in the selection tree pane and select Edit System and the following screen displays:

Figure 62: Edit System



Step 2 The user can change the system level CLI prompt prefix, set Management Traffic Bridging, Management Traffic Bridging Security, Proxy ARP, Date, Time, System Time of Day, Source TOD Clock, FTP, HTTP, HTTPS, SSL Cipher Strength, SCP, Serial Port, Serial Port Auto Log Off, SFTP, SSH, Telnet, Authentication Traps, CLI Security Prompt and SNMP Engine ID. For information on these system options see “System Configuration” on p. 445.

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Note

The System identity information that is not available for editing on this screen (Name, Description, Location, Contact), is the same identity information that displays in the NE-1 view and is editable on the NE-1 “Edit Configuration” display.

Step 3 Check that the information entered in Step 2 is what is desired and click on OK. The display will change to reflect the entered data.

End of Procedure

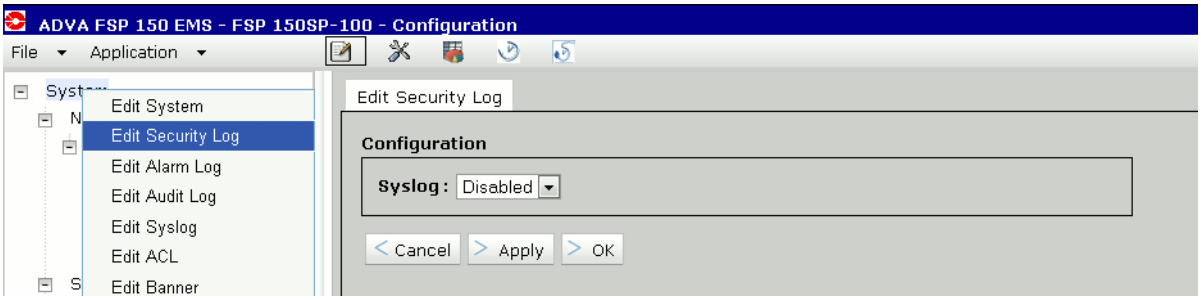
Configure Logs

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 Right click on “System” in the selection tree pane and select **Edit Security Log** and the following screen displays:

Figure 63: Edit Security Log View



Step 2 Select “Enabled” to include Security Log messages in the Syslog or “Disabled” to not include Security Log messages in the Syslog and click on **OK**.

Step 3 Right click on “System” in the selection tree pane and select Edit Alarm Log and the following screen displays:

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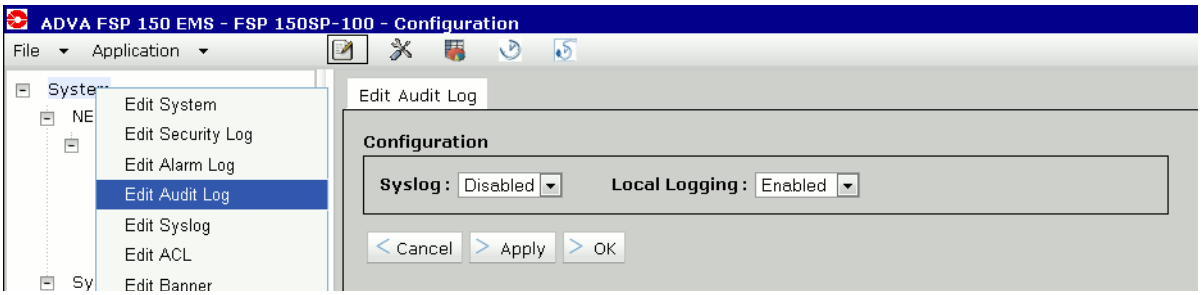
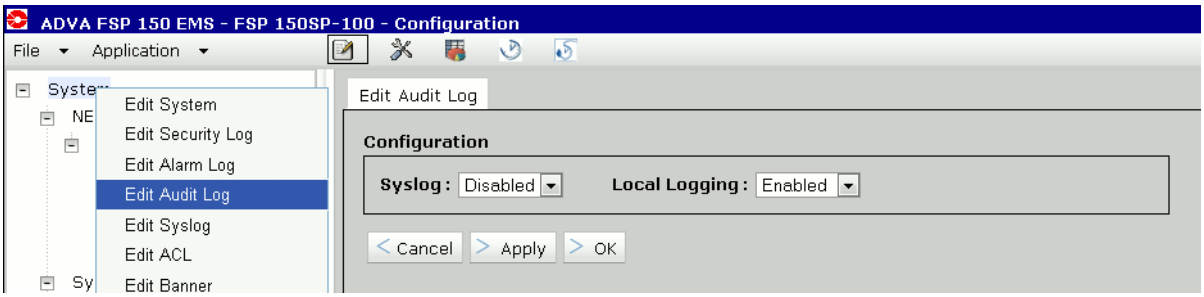
Figure 64: Edit Alarm Log View



Step 4 For Syslog Enable, select “Enabled” to include Alarm Log messages in the Syslog or “Disabled” to not include Alarm Log messages in the Syslog; for Local Logging, select “Enabled” or “Disabled” to Enable or Disable sending Alarm messages to the local log (Alarm Log tab) and click on **OK**.

Step 5 Right click on “System” in the selection tree pane and select Edit Audit Log and the following screen displays:

Figure 65: Edit Audit Log View



Step 6 For Syslog, select “Enabled” to include Audit Log messages in the Syslog or “Disabled” to not include Audit Log messages in the Syslog; for Local Logging, select “Enabled” or “Disabled” to Enable or Disable sending Alarm messages to the local log (Alarm Log tab) and click on **OK**.

Step 7 Right click on “System” in the selection tree pane and select Edit Syslog and the following screen displays:

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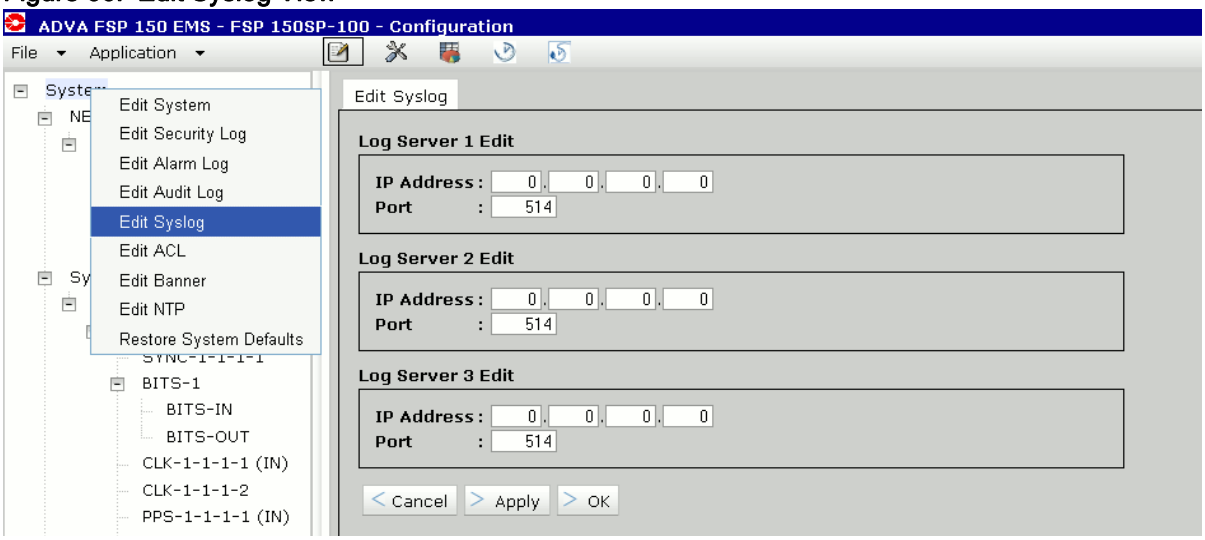
Figure 66: Edit Syslog View



Step 8 Enter Syslog Server information (IPv4 Address and Port) for up to 3 servers (the default port number is 514).

Click on **OK**.

End of Procedure

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Configure ACL

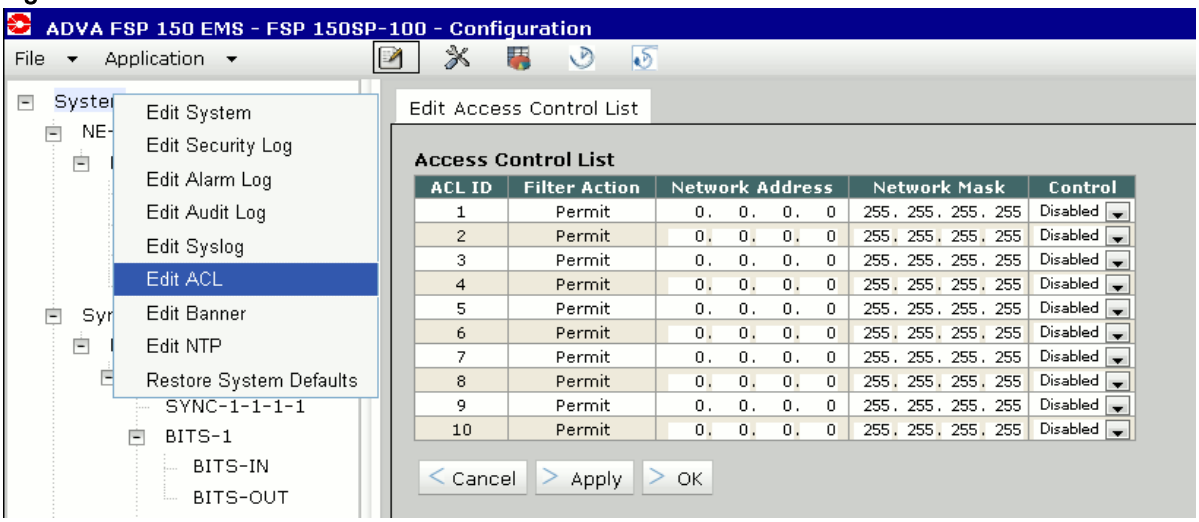
The Access Control List (ACL) allows the user to limit access to the NE via the DCN or management tunnels to specific IP addresses or IP address ranges (subnetworks). Up to ten entries can be made, and each entry can be individually enabled or disabled. All enabled entries apply to all management interfaces.

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see "Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port" on p. 276) and is logged on using eVision.

Procedure

Step 1 Right click on "System" in the selection tree pane and select **Edit ACL** and the following screen displays:

Figure 67: Edit ACL


ADVA FSP 150 EMS - FSP 150SP-100 - Configuration
File
Application
Edit System
Edit Security Log
Edit Alarm Log
Edit Audit Log
Edit Syslog
Edit ACL
Edit Banner
Edit NTP
Restore System Defaults
SYNC-1-1-1-1
BITS-1
BITS-IN
BITS-OUT
Edit Access Control List
Access Control List
ACL ID
Filter Action
Network Address
Network Mask
Control
1 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
2 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
3 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
4 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
5 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
6 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
7 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
8 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
9 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
10 Permit 0. 0. 0. 0 255. 255. 255. 255 Disabled
Cancel
Apply
OK

Step 2 The Access Control List contains 10 entries. Each entry consists of an IP address and network mask, and each entry can be enabled or disabled.

Edit the Control status, Network Address and Network Mask for each entry, and click on **OK**. The display will change to reflect the entered data.

End of Procedure

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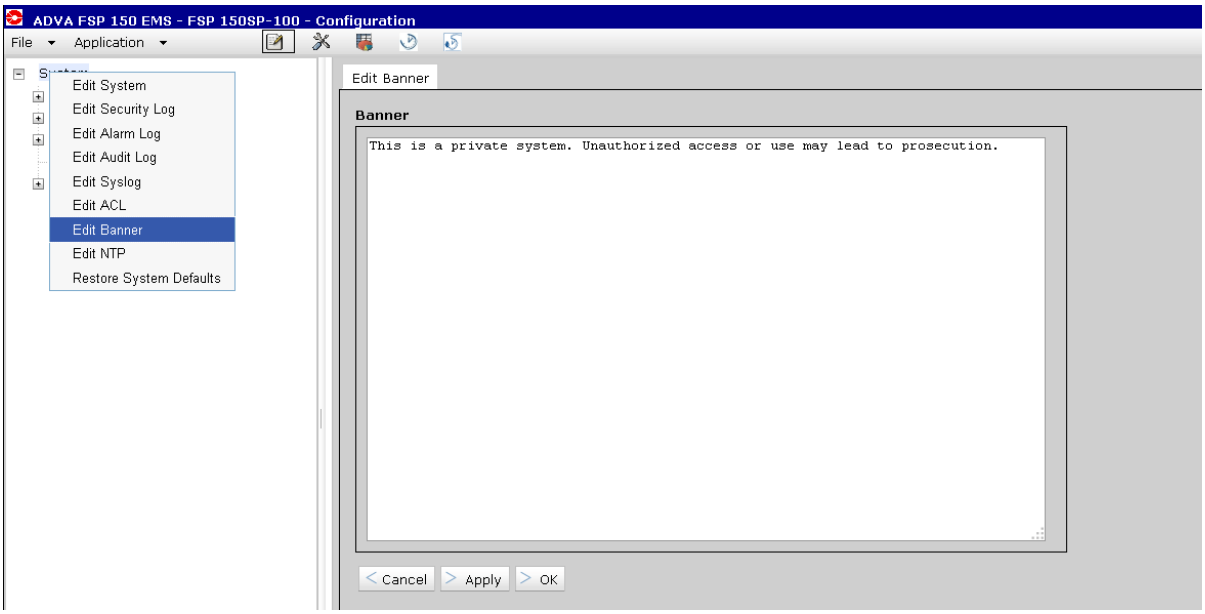
Edit the Security Banner

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 Right click on “System” in the selection tree pane and select **Edit Banner** and the following screen displays:

Figure 68: Edit Banner



Step 2 The Banner is displayed for each CLI or GUI login. The banner can be edited to contain a customized message of up to 1024 characters. The default banner message is “This is a private system. Unauthorized access or use may lead to prosecution.”

Edit the Banner, then click on **OK** and the screen will update to display the edited banner message.

End of Procedure

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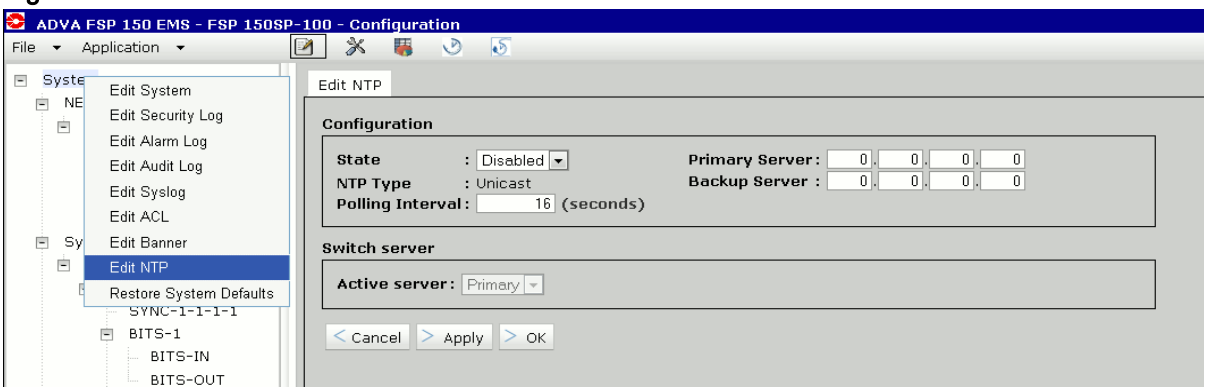
Configure NTP

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 Right click on “System” in the selection tree pane and select **Edit NTP** and the following screen displays:

Figure 69: Edit NTP



Step 2 The NTP function can be Enabled or Disabled. If Enabled, there should be at least a Primary Server designated by setting its IP address. There can also be an IP address designated for a Backup Server.

The Polling Interval can be set to 16, 32, 64, 128, 256, 512 or 1024 seconds. The default is 16 seconds.

If both a Primary and Backup Server are configured, the user can make either one Active.

After editing the NTP information, click on **OK**. The display will update to show the edited information.

End of Procedure

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Provision NE-1 Common Units

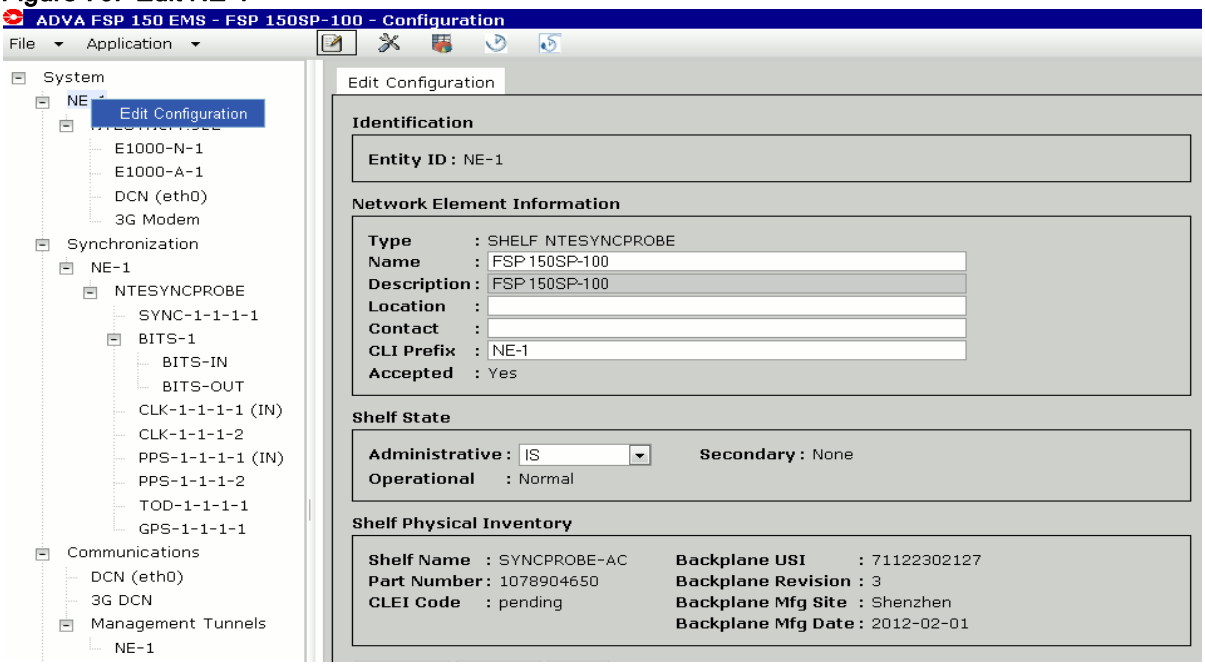
Configure NE-1 (FSP 150SP-100)

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 Expand the System entity, right click on “NE-1” in the selection tree pane and select **Edit Configuration**. The following screen displays:

Figure 70: Edit NE-1



Step 2 The Administrative State can be changed between IS (default value) and Management. (See “Entity State Descriptions” on p. 430).

NE Identity information can also be changed or entered; Name, Location and Contact.

After editing the NE information, click on **OK**. The display updates to show the edited information.

Note

The NE-1 identity information that is available for editing on this screen except for CLI Prefix, is the same identity information that displays in the System view.

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End of Procedure

Configure NTESP100

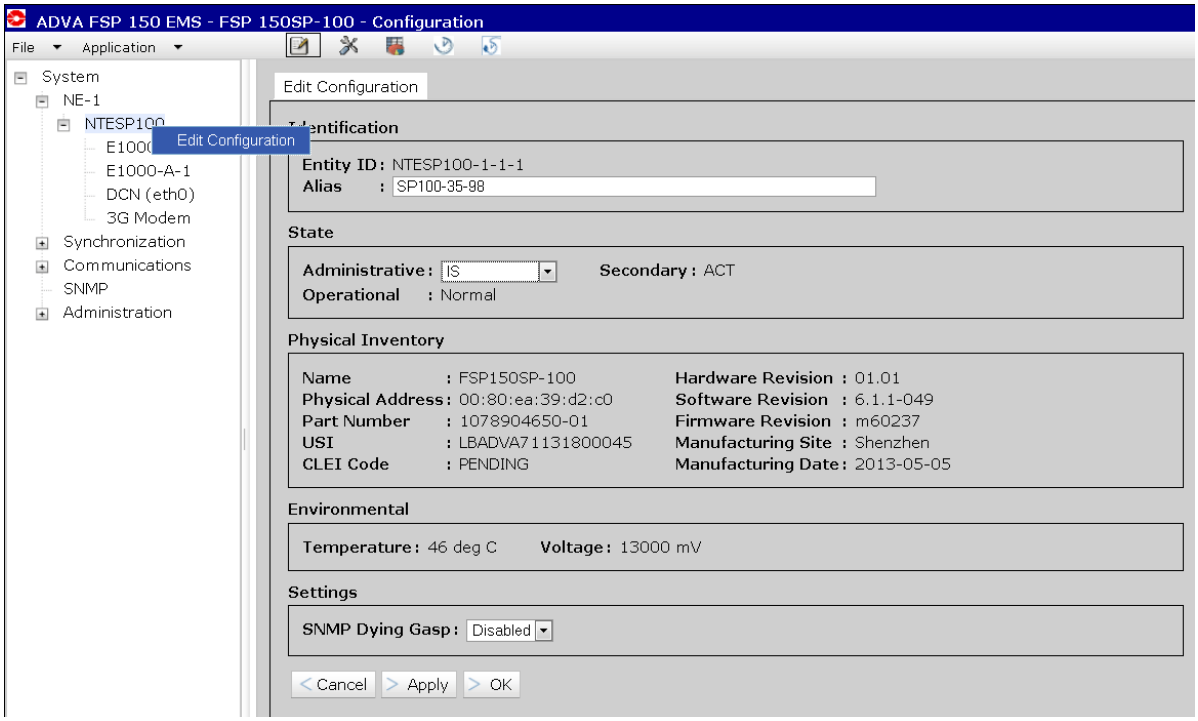
The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 If a “+” sign appears next to NE-1 in the selection tree pane, click on it to expand the NE view, then click on the “+” sign next to NTE20x to expand it.

Right click on “NTESP100” in the selection tree pane and select **Edit Configuration** and the following screen displays:

Figure 71: Edit NTESP100



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Step 2 The Administrative State can be changed between IS (default value) and Management. (See “Entity State Descriptions” on p. 430)

An alias can be entered to permit easy identification of this particular NTESP100.

SNMP Dying Gasp can be Enabled. Default is Disabled.

After editing the NTESP100 information, click on **OK**. The display will update to show the edited information.

End of Procedure

Provision Secure Access

Secure Access involves several different aspects:

- The FSP 150SP accommodates various methods of access to the system including serial port, telnet, SSH, HTTP, HTTPS, FTP, SFTP and SCP. These are viewable and editable from the System and Edit System view respectively (see “All System options are provisioned using the Configuration application by clicking on the Configuration icon, or selecting “Configuration” from the application drop-down list.” on p. 162).
- Access via SSH and SSL based protocols, uses certificates and keys that are user configurable. (see “Configure Security Keys” on p. 171).
- The local user access security policy can be configured for low, medium or high security levels. (see “Configure Security Policy” on p. 174).
- Access can be restricted by using the Access Control List (ACL) where only designated IP addresses or subnetworks are permitted to access the system (see “Configure ACL” on p. 166).
- Access to the system can be limited by use of locally defined users including user ID, password and access level (superuser, provisioning, maintenance or monitoring). See “Configure Local Users” on p. 176.
- Access to the system can be restricted by using remote authentication with an externally defined and controlled user set. See “Configure Remote Authentication” on p. 179.

Configure Security Keys

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on as a superuser using eVision.

Note

Changing the security keys may interrupt any current secure sessions that have used the existing keys for authentication.

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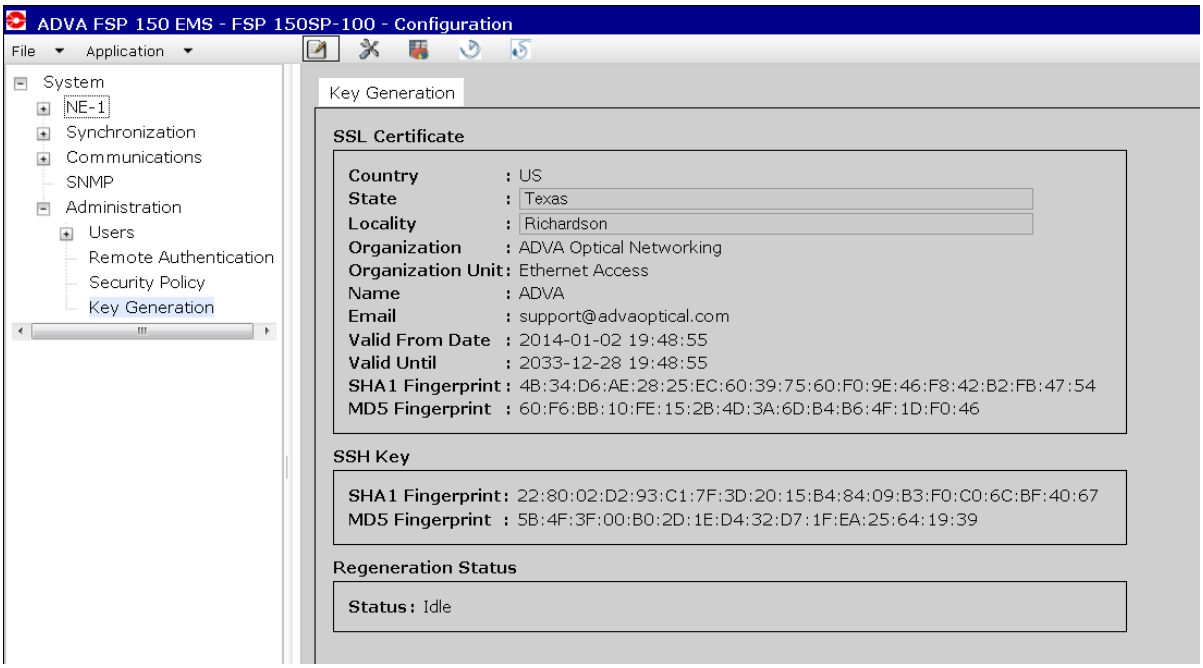
From the Configuration view with the Administration tree expanded:

Procedure

Step 1 Left click on “Key Generation” in the selection tree pane and the following screen displays to show the current SSL Certificate and SSH Key information:

Figure 72: Display SSL Certificate and SSH Key



Step 2 To regenerate the SSL Certificate or SSH Key, right click on “Key Generation” in the selection tree pane and select **Regenerate Keys** and the following screen displays (see Figure 74 on p. 173):

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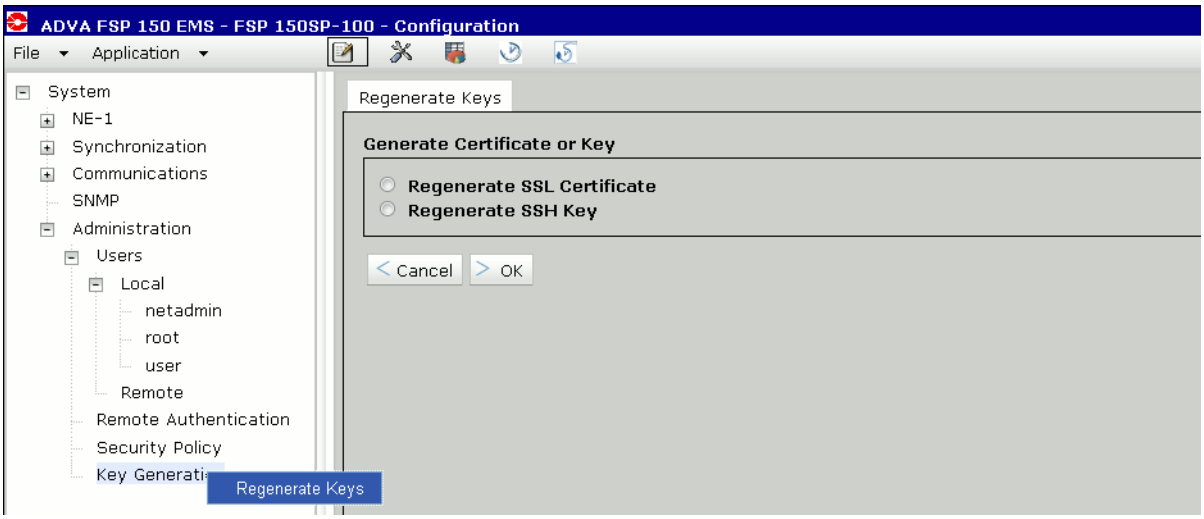
Figure 73: Regenerate Keys

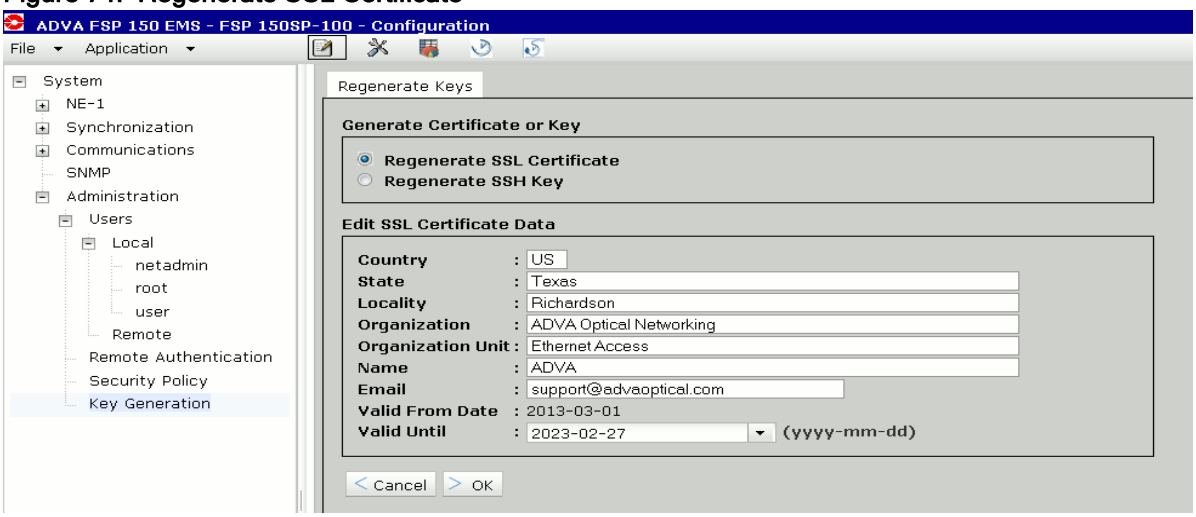


Step 3 To regenerate the SSL Certificate, select the “Regenerate SSL Certificate radio button, click **OK** for the message pop-up and the following screen displays (see Figure 74 on p. 173):

Note

When an SSL Certificate is generated, the HTTP server will be restarted and web access will be unavailable during this time (approximately 15 seconds).

Figure 74: Regenerate SSL Certificate



Step 4 Edit the Certificate Data, then click on **OK**.

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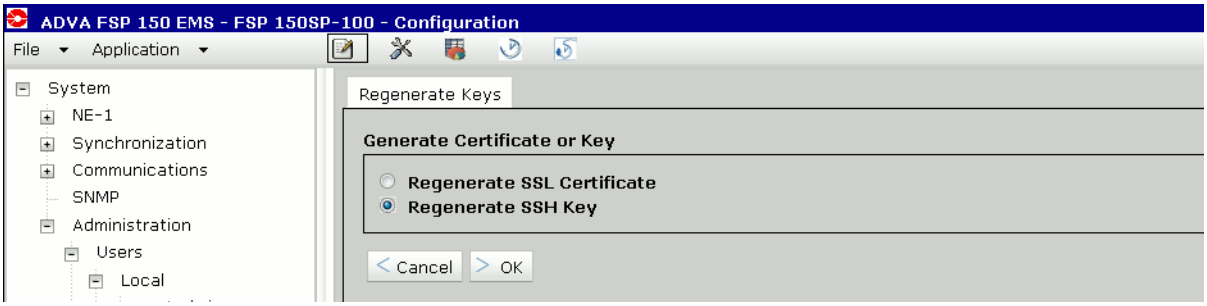
Step 5 To regenerate the SSH Key, select the radio button next to “Regenerate SSH Key”, click OK on the message pop-up and the following screen displays:

Note

When an SSH Key is generated, all SSH users will be logged off.

Figure 75: Regenerate SSH Key



Step 6 Click on **OK**.

End of Procedure

Configure Security Policy

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on as a superuser using eVision.

From the Configuration view with the Administration tree expanded:

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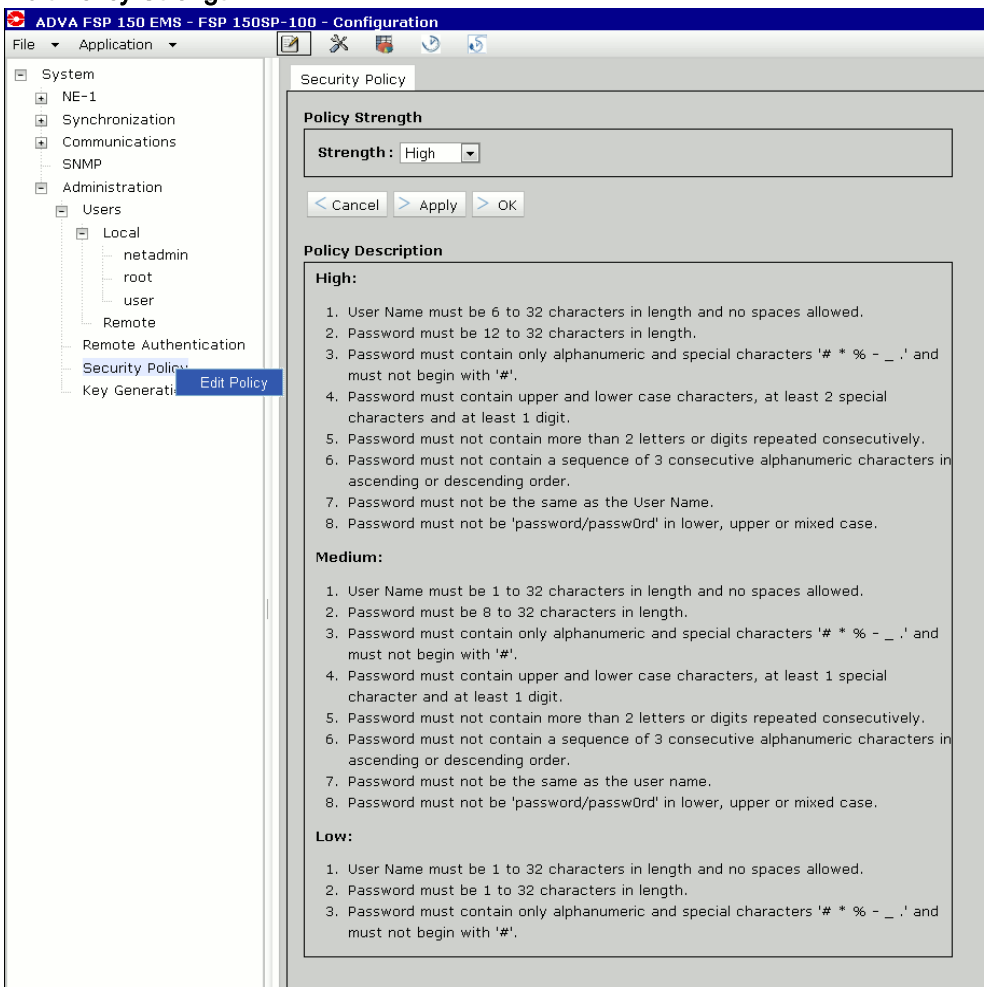
Procedure

Step 1 Right click on “Security Policy” in the selection tree pane and select **Edit Policy**, and the following screen displays to show the current Policy Strength setting and a description of the policy rules:

Figure 76: Edit Policy Strength


ADVA FSP 150 EMS - FSP 150SP-100 - Configuration
File
Application
System
NE-1
Synchronization
Communications
SNMP
Administration
Users
Local
netadmin
root
user
Remote
Remote Authentication
Security Policy
Key Generati
Edit Policy
Security Policy
Policy Strength
Strength : High
Cancel
Apply
OK
Policy Description
High:
1. User Name must be 6 to 32 characters in length and no spaces allowed.
2. Password must be 12 to 32 characters in length.
3. Password must contain only alphanumeric and special characters '# * % - _ .' and must not begin with '#'.
4. Password must contain upper and lower case characters, at least 2 special characters and at least 1 digit.
5. Password must not contain more than 2 letters or digits repeated consecutively.
6. Password must not contain a sequence of 3 consecutive alphanumeric characters in ascending or descending order.
7. Password must not be the same as the User Name.
8. Password must not be 'password/passw0rd' in lower, upper or mixed case.
Medium:
1. User Name must be 1 to 32 characters in length and no spaces allowed.
2. Password must be 8 to 32 characters in length.
3. Password must contain only alphanumeric and special characters '# * % - _ .' and must not begin with '#'.
4. Password must contain upper and lower case characters, at least 1 special character and at least 1 digit.
5. Password must not contain more than 2 letters or digits repeated consecutively.
6. Password must not contain a sequence of 3 consecutive alphanumeric characters in ascending or descending order.
7. Password must not be the same as the user name.
8. Password must not be 'password/passw0rd' in lower, upper or mixed case.
Low:
1. User Name must be 1 to 32 characters in length and no spaces allowed.
2. Password must be 1 to 32 characters in length.
3. Password must contain only alphanumeric and special characters '# * % - _ .' and must not begin with '#'.

Step 2 To change the Policy Strength, select the desired setting from the Strength drop-down list, then click on **OK**.

End of Procedure

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Configure Local Users

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 Expand the System, Administration, Users and Local entities in the selection tree pane, by clicking on the “+” signs next to each entity to expand each view.

Step 2 Determine the next step.

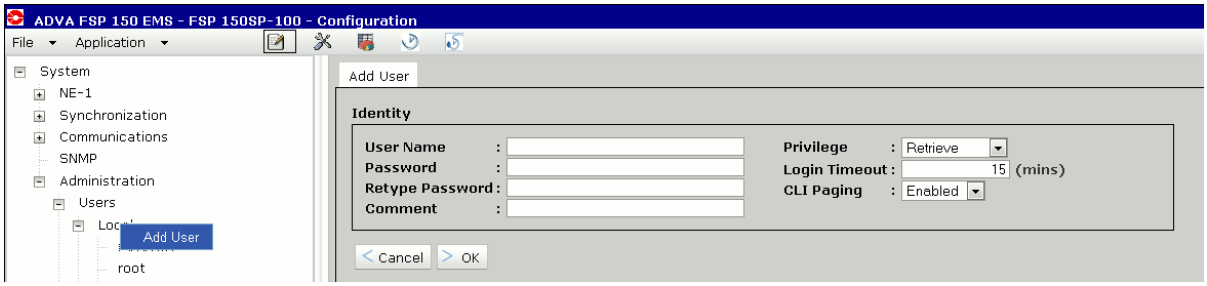
Current Status	Then
Entering a new user?	Continue with the next step.
Editing data other than the password for an existing user?	Go to Step 5.
Editing just the password for an existing user?	Go to Step 7.
Deleting a user?	Go to Step 9.
Remove a login lock-out?	Go to Step 11.

Note

Entering a new user can only be done by a user with superuser privilege.

Step 3 Right click on “Local” in the selection tree pane and select **Add User** and the following screen displays:

Figure 77: Add User



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Step 4 Enter the required data to establish a new user. Details on the function and rules for each data entry is located at “Administration” on p. 464.

After editing the user information, click on **OK**. The display will update to show the edited information.

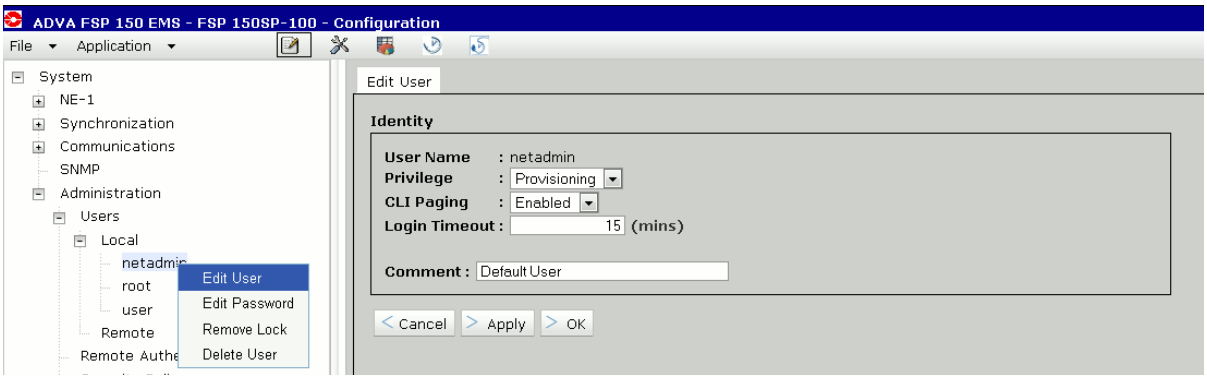
End of Procedure

Note

Editing user data other than the user’s own password can only be done by a user with superuser privilege.

Step 5 Right click on the user name to be edited in the selection tree pane and select **Edit User** and the following screen displays:

Figure 78: Edit User



Step 6 Edit the required data for this user. Details on the function and rules for each data entry is located at “Administration” on p. 464.

After editing the user information, click on **OK**. The display will update to show the edited information.

End of Procedure

Note

Editing the user password can be done by the user or a user with superuser privilege.

Step 7 Right click on the user name to be edited in the selection tree pane and select **Edit Password** and the following screen displays:

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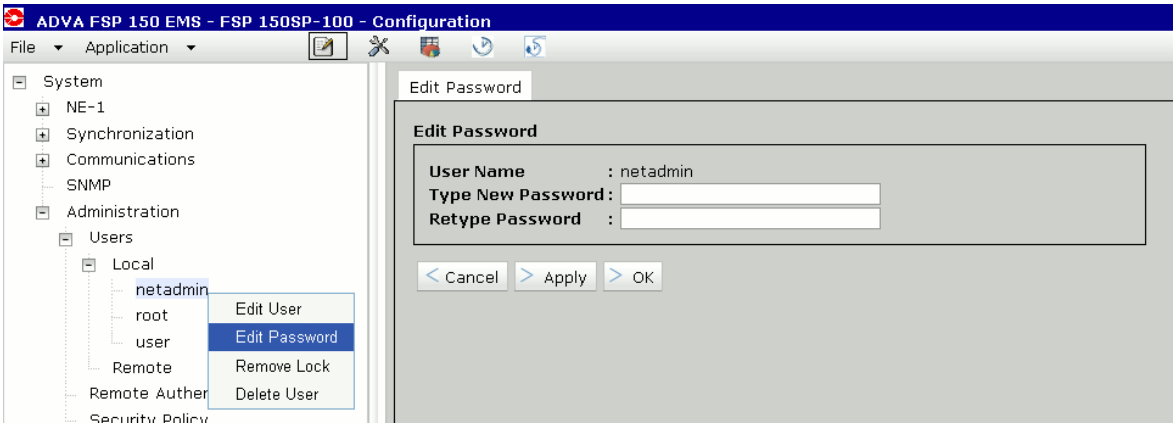
Figure 79: Edit User Password



Step 8 Edit the password for this user. Details on the function and rules for each data entry is located at “Administration” on p. 464.

After editing the password, click on **OK**. The display will update to show the edited information.

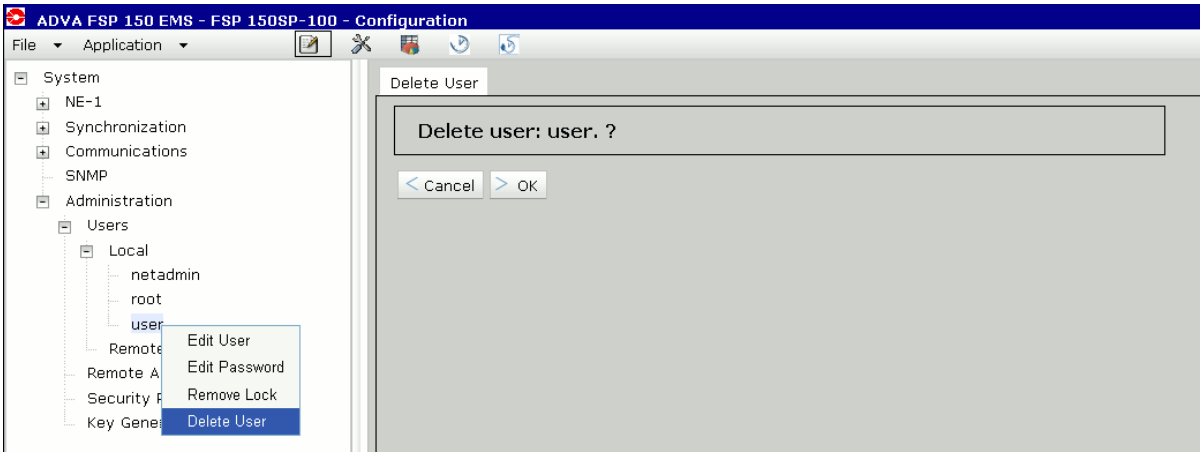
End of Procedure

Note

Deleting a user requires superuser privilege.

Step 9 Right click on the User Name to be deleted, select **Delete User**, and the following screen displays:

Figure 80: Delete User



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Step 10 Verify that the selected user is the one to be deleted. Click on **OK**. The display will update to show the deleted information.

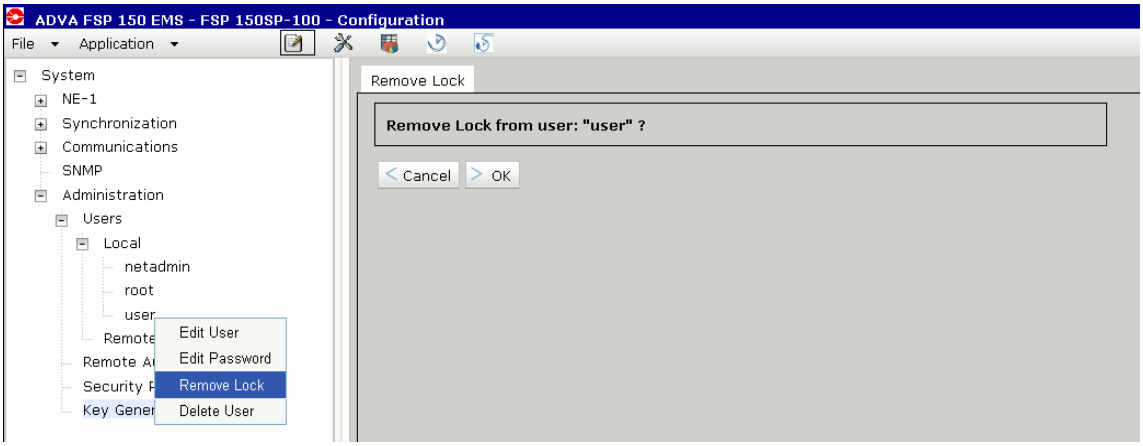
End of Procedure

Note

Removing a lock-out from a user requires superuser privilege.

Step 11 Right click on the User Name that is locked, select **Remove Lock**, and the following screen displays:

Figure 81: Remove Lock



Step 12 Verify that the selected user is the one from whom the lock-out is to be removed. Click on **OK**. The display updates.

End of Procedure

Configure Remote Authentication

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 Expand the System and Administration entities in the selection tree pane, by clicking on the “+” signs next to each entity to expand each view.

Step 2 Right click on “Remote Authentication” in the selection tree pane and select **Edit Remote Authentication** and the following screen displays:

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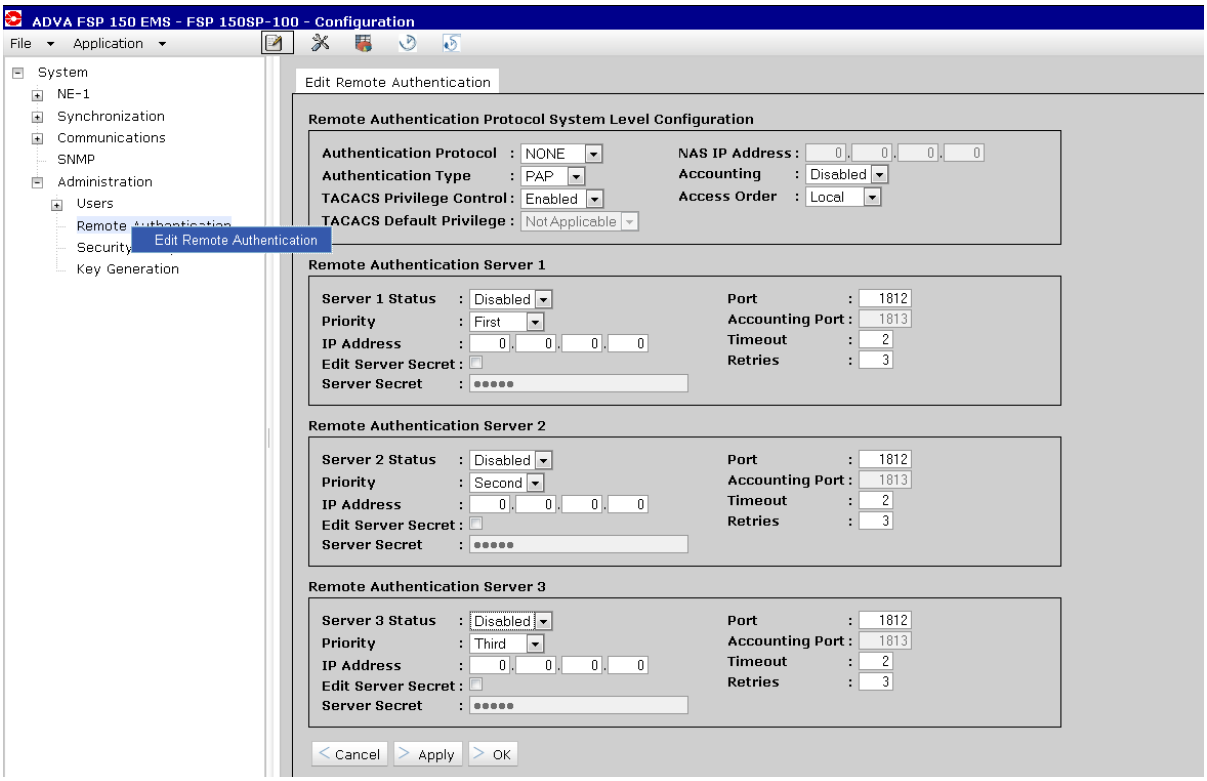
Figure 82: Edit Remote Authentication



Step 3 Enter the required data for the Remote Authentication Protocol System Level Configuration including Authentication Protocol, Authentication Type, TACACS Privilege Control, TACACS Default Privilege, NAS IP Address (RADIUS only), Accounting, and Access Order. Details on the function and rules for each entry is located at "Administration" on p. 464 and the *FSP 150SP-100 Technical Descriptions* document.

Step 4 Enter the required data for each Remote Authentication Server (1, 2 and 3) including Server Status, Priority, IP Address, Server Secret, Port, Accounting Port, Timeout and Retries. Details on the function and rules for each entry is located at "Administration" on p. 464 and the *FSP 150SP-100 Technical Descriptions* document.

Note

If Remote Authentication is activated, local access may be restricted or disabled.

Step 5 Verify that all data is entered properly, then click on **OK**.

End of Procedure

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Provision SNMP Access

SNMP information is contained in the *FSP 150SP-100 SNMP Reference Manual*

Data on setting for SNMP settings are located at "SNMP" on p. 461 and the *FSP 150SP-100 Technical Descriptions* document.

Provision Access Port

Refer to the following procedures for provisioning and editing Access Port Services (Access Port is a Copper-based LAN or Fiber-based LAN).

Ethernet Virtual Private Line (EVPL) Service Provisioning

Refer to the following for provisioning a port in Ethernet Virtual Private Line (EVPL) Mode. It is recommended that you pre-determine the provisioning details and ensure that they meet the FSP 150SP's provisioning rules prior to making changes to an existing service or placing an additional Access Port into service. Ensure that CIR, EIR, CBS, EBS settings are compatible and C-Tag/S-Tag VLAN ID-Priority values will not conflict with another Access Port/Flow that is in the Assigned state.

Refer to "Access Port Configuration Options and Rules" on p. 473 to determine the default values, value ranges and rules for each option in the following procedure.

Procedure

Step 1 Observe the current Service Type. The status will be used in the following steps.

a) Select Configuration view.

b) Expand the System Name, NE-1 and NTESP100 entities in the Selection Tree, by clicking on the "+" signs next to each entity.

c) Select the Access Port facility (E1000-A-1) in the Selection Tree.

The Access Port facility status window is displayed and the Configuration Tab is selected

Step 2 Right click on the Access Port facility and select **Edit Configuration**.

An Edit Configuration window appears

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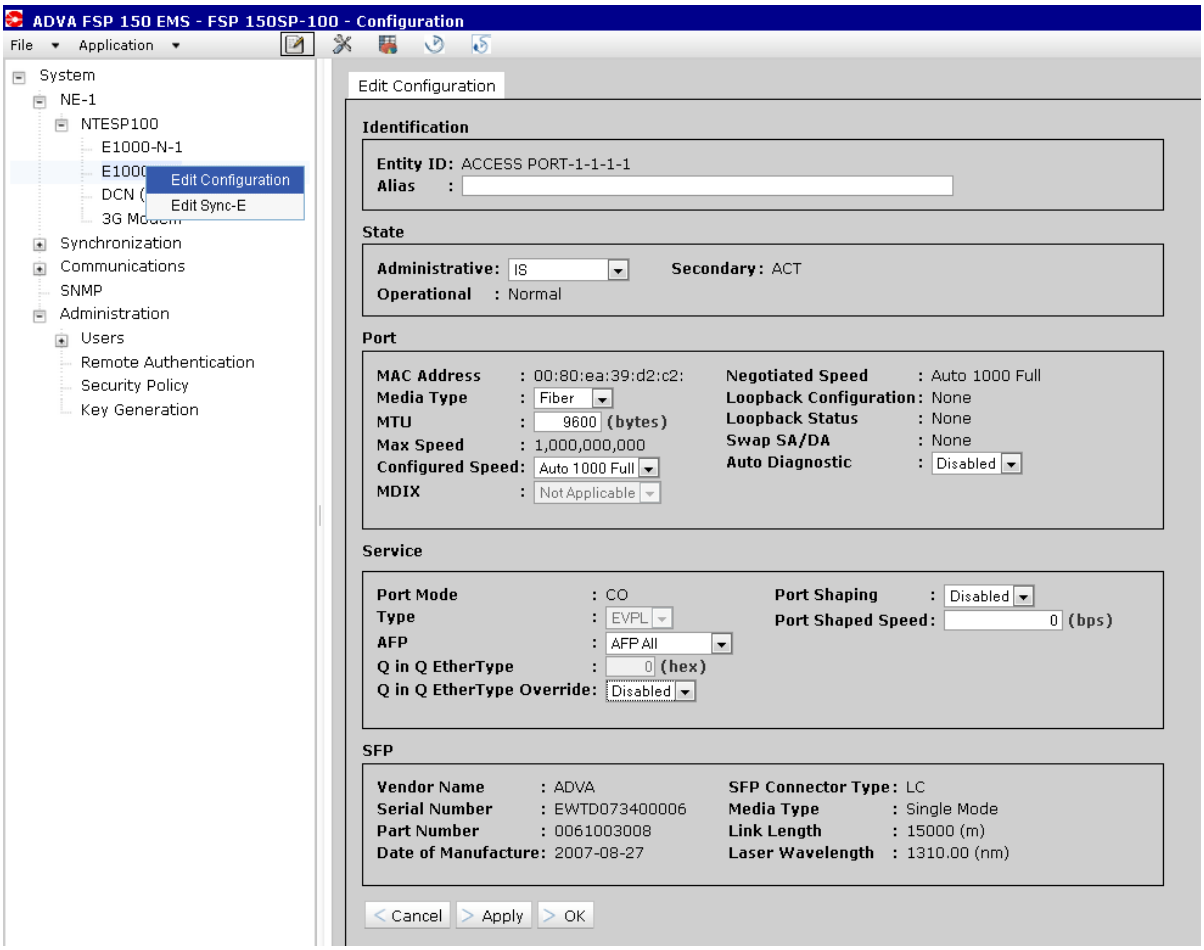
Figure 83: Edit Access Port EVPL Configuration View



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Step 3 Enter the Access Port facility changes:

Identification

a) Enter an Alias, as required

State

b) Set the Administrative State to the desired state

Port

c) Select the desired Media Type

d) Enter the desired MTU size

e) Select the Configured Speed option

f) Select the Port MDIX option (copper)

g) Enable/Disable Auto Diagnostic

Service

h) Select the desired AFP option

i) Enable/Disable Q in Q EtherType Override

j) Edit the Q in Q Ethertype setting if desired (requires Q in Q Override Enabled)

k) Enable/Disable Port Shaping

l) Enter the desired Port Shaped Speed (Setting can not be lower than the CIR setting for the flow) if Port Shaping is Enabled.

m) Enable/Disable N2A (Network to Access) VLAN Trunking

Click on **OK**.

Note

For configuration of PTP functionality, see "Provision Precision Time Protocol (PTP)" on p. 208.

For configuration of Sync-E functionality, see "Provision Synchronization" on p. 186.

End of Procedure

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Provision Network Port

The following procedures assume that the user has completed the physical installation procedures in “Physical Installation” on p. 73, including installation of SFPs and connecting fiber cables to the Network Port. It is also assumed that the user has configured the NID with an IP address and connected the NID to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276). It is also assumed that the user is logged on to eVision with the proper privilege level for provisioning (see “User Authorization Privilege Levels” on p. 436) and is in the configuration view.

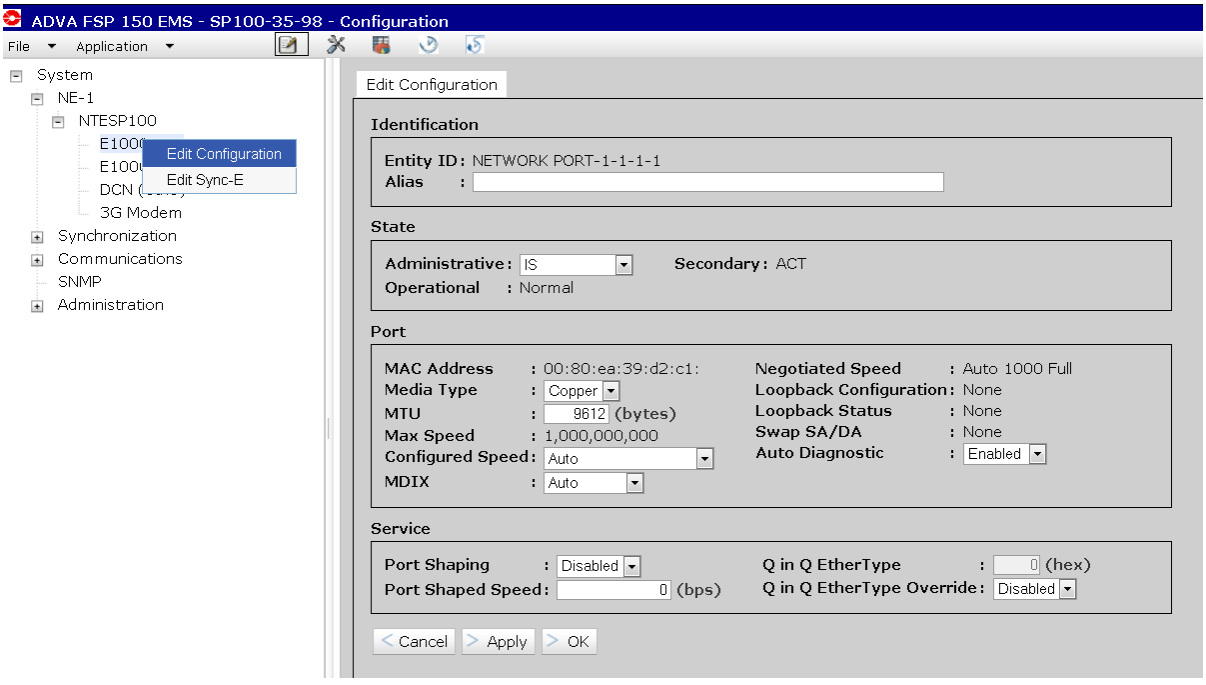
Configuring Network Port

Procedure

Step 1 Expand the System Name, NE-1 and NTESP100 entities in the Selection Tree, by clicking on the “+” signs next to each entity.

Step 2 Right click on the E1000-N-1 interface in the selection tree pane and select **Edit Configuration** and the following screen displays:

Figure 84: Edit Network Interface



Step 3 Various Port and Service data can be edited. For details on each editable item see “Network Port Configuration Options and Rules” on p. 469.

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Step 4 Enter the Network Port facility changes:

Identification

a) Enter an Alias, as required

State

b) Set the Administrative State to “IS”

Port

c) Select the desired Media Type

d) Enter the desired MTU size

e) Select the Configured Speed option

f) Select the Port MDIX option (copper)

g) Enable/Disable Auto Diagnostic

h) Enable/Disable Drop Eligibility Indicator

Service

i) Enable/Disable Port Shaping

j) Enter the desired Port Shaped Speed (Setting can not be lower than the CIR setting for the flow) if Port Shaping is Enabled.

k) Enable/Disable Q in Q EtherType Override

l) Edit the Q in Q Ethertype setting if desired (requires Q in Q Override Enabled)

Click on **OK**.

Note

For configuration of PTP functionality, see “Provision Precision Time Protocol (PTP)” on p. 208.

For configuration of Sync-E functionality, see “Provision Synchronization” on p. 186.

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Provision Synchronization

Provision Synchronous Ethernet (Sync-E) and Precision Time Protocol (PTP)

SP-100 provides Sync-E functionality on the Network Port and Access Port. The following procedure provides the steps necessary to configure Sync-E on the SP-100.

Sync-E is enabled on a per Ethernet Port basis. The Sync-E mode attribute supports the values of enabled or disabled (default for all ports is disabled). If a port has Sync-E mode enabled, then it can be selected as a reference source for the System Clock. If Sync-E mode is disabled for that port, it is not shown in the pick-list for System Clock references.

SP-100 supports both SDH (Option 1) and SONET (Option 2) synchronization capability. The default is SDH (Option1). For SDH, the BITS interfaces support both E1 and 2048 kHz options. For SONET, the BITS interfaces support T1 only. For Synchronization provisioning rules, see “Synchronization” on p. 451.

While the BITS-IN and BITS-OUT interfaces can be individually enabled and configured, they share basic configuration settings, so that changing the line type or coding of one simultaneously changes the same settings on the other.

Steps in Provisioning Sync-E and PTP:

- Edit System Sync-E
- Provision BITS-IN/OUT
- Provision PTP
- Provision and Enable Sync-E on associated Ethernet Ports
- Provision CLK, PPS and GPS interfaces
- Provision and associate Timing Domain on associated Facilities
- Add Sync Reference Sources (Sync-E enabled Network Port, Access Port, BITS-IN and/or Telecom Slave) to System Sync Domain (SYNC-1-1-1-1)

Ethernet services support one System Sync Domain with up to four reference sources, which may be associated with an Ethernet Access Port, Network Port, BITS-IN, CLK In, PPS In, GPS or a Telecom Slave.

For Synchronization provisioning rules, see “Synchronization” on p. 451.

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The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see "Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port" on p. 276) and is logged on with at least a Provisioning level user permissions using eVision. All steps in the following procedure are performed in the Configuration Application.

Procedure

Step 1 Select the Configuration Application on the tool bar or select Configuration from the Application Menu. Expand the System, Synchronization, NE-1, NTESP100 and BITS-1 entities in the selection tree pane, by clicking on the "+" signs next to each entity to expand each view.

Step 2 Determine the next step.

Desired Function	Then
Configure System Sync?	Continue with the next step
Configure PTP?	Go to Provision Precision Time Protocol (PTP).
Configure BITS-IN?	Go to Step 6.
Configure BITS-OUT?	Go to Step 9.
Configure a 10MHz Clock Port?	Go to Step 12.
Configure a PPS Port?	Go to Step 16.
Configure ToD Port?	Go to Step 20.
Configure the GPS Port?	Go to Step 24.
Edit System Time of Day?	Go to Step 37.
Configure Sync-E for Network/Access Ports?	Go to Step 44.
Add a Sync Reference?	Go to Step 47.
Edit a Sync Reference?	Go to Step 52.
Delete a Sync Reference?	Go to Step 55.
All Synchronization provisioning is completed?	End of Procedure

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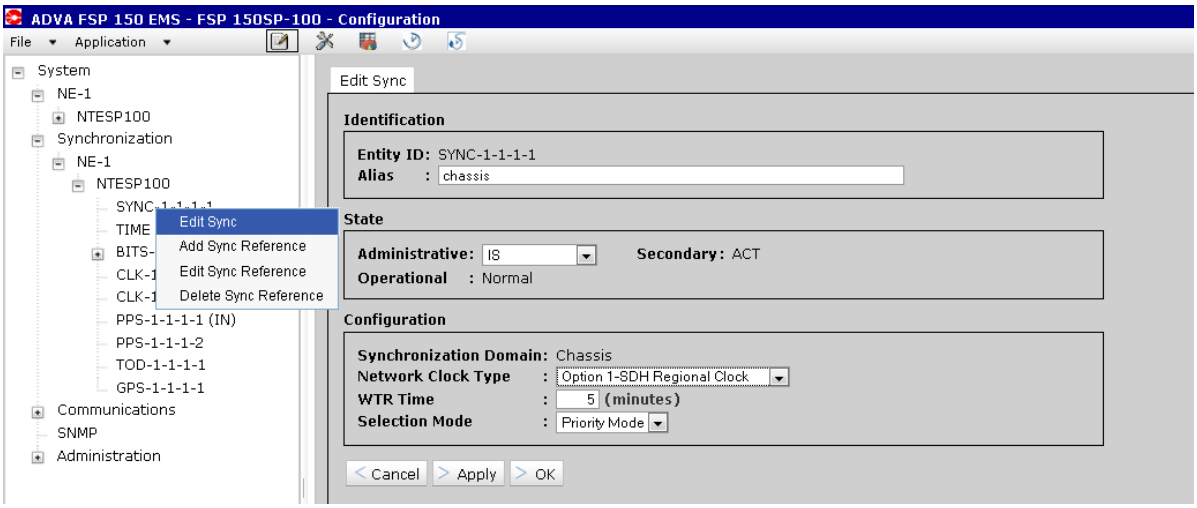
Edit System Sync

Step 3 Right click on SYNC-1-1-1-1 and select **Edit Sync**. The following screen displays:

Figure 85: Edit System Sync



Step 4 If desired, enter an Alias.

Ensure the Administrative State is set to IS.

Select the desired Network Clock Type, Option 1-SDH Regional Clock, or Option 2-SONET Regional Clock.

If desired, edit the Wait To Restore (WTR) time.

Select the desired Selection Mode (QL Mode or Priority Mode).

Note

Changing the Network Clock Type changes the options available for Sync-E functions on BITS-IN, BITS-OUT, Access Port and Network Port. If any of these interfaces were previously configured for Sync-E functions, the Assumed QL, Expected QL and Squelch QL settings revert to default values and have to be reconfigured.

Click on **OK**.

Step 5 Go to Step 2

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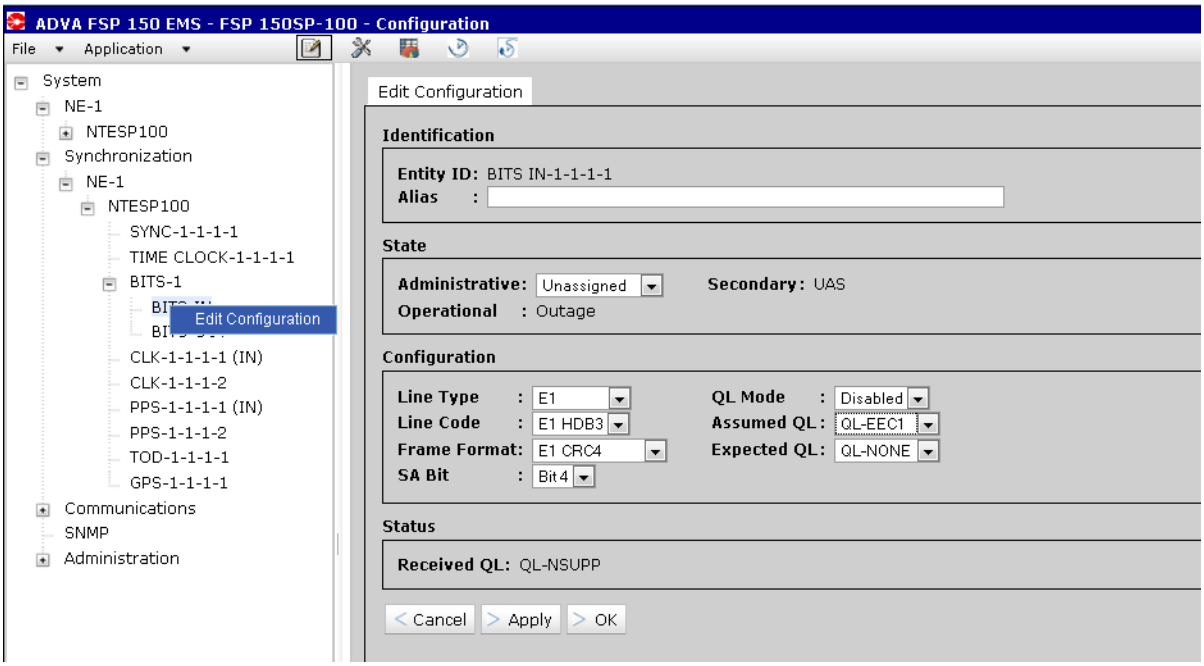
Edit BITS-IN

Step 6 Right click on BITS-IN and select **Edit Configuration**. The following screen displays (see Figure 86 on p. 189):

Figure 86: Edit BITS-IN



Step 7 Enter an Alias if desired.

Select the desired Administrative State.

Select the desired Configuration settings, starting with Line Type, as the Line Type selection changes the options available for Line Code, Frame Format, SA Bit and QL Mode.

If using SDH (Option-1), E1 and 2048 kHz are supported. If using SONET (Option-2), T1 is supported.

Note

Line type, line code, frame format and SA bit (for E1) settings for BITS-IN and BITS-OUT are shared. Changing one changes the other.

For SDH (Option-1), if QL Mode is Disabled, Assumed QL must be set to a value other than None.

BITS will not show up as a potential synchronization reference if the administration state is set to Unassigned.

Click on **OK**.

Step 8 Determine the next step.

Desired Function	Then
Configure BITS-OUT?	Go to Step 9.
Other?	Go to Step 2.

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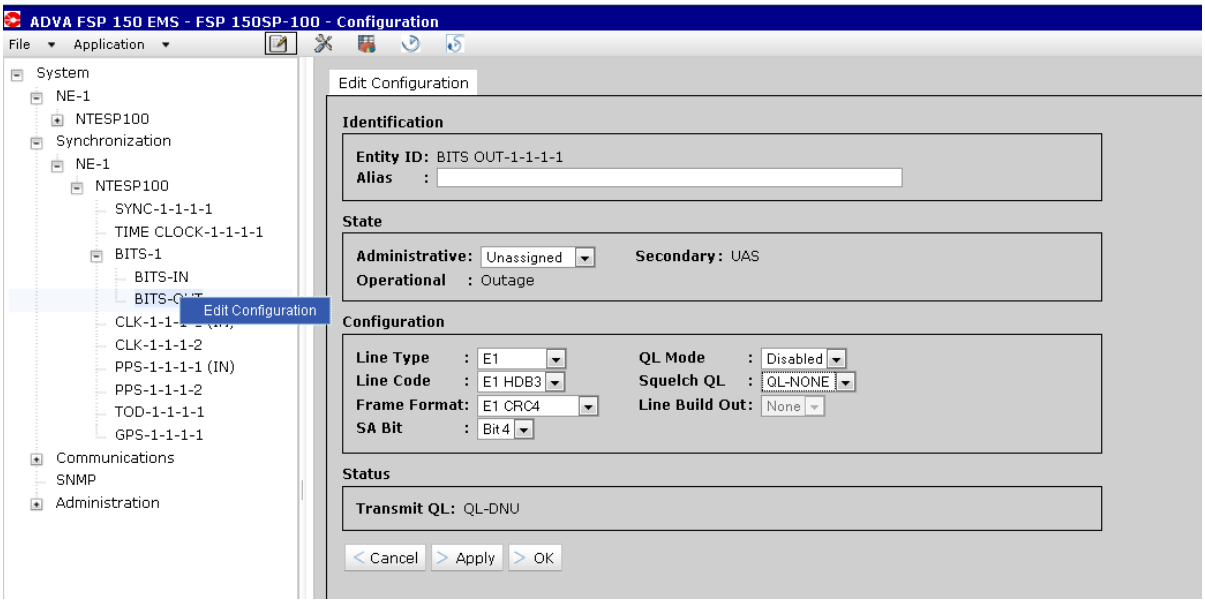
Edit BITS-OUT

Step 9 Right click on BITS-OUT and select **Edit Configuration**. The following screen displays (see Figure 87 on p. 190):

Figure 87: Edit BITS-OUT



Step 10 Enter an Alias if desired.

Select the desired Administrative State.

Select the desired Configuration settings, starting with Line Type, as the Line Type selection changes the options available for Line Code, Frame Format, SA Bit and QL Mode.

If using SDH (Option-1), E1 and 2048 kHz are supported. If using SONET, T1 is supported.

Note

Line type, line code, frame format and SA bit (for E1) settings for BITS-IN and BITS-OUT are shared. Changing one changes the other.

Squelch QL setting means if the reference clock drops below this setting, the BITS-OUT output will be suppressed.

As part of the Ethernet port Sync-E reference set up, the Administration State should not be set to Unassigned.

Click on **OK**.

Step 11 Go to Step 2.

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Edit 10 MHz Clock Port

Refer to the following procedure for provisioning the 10 MHz Clock port.

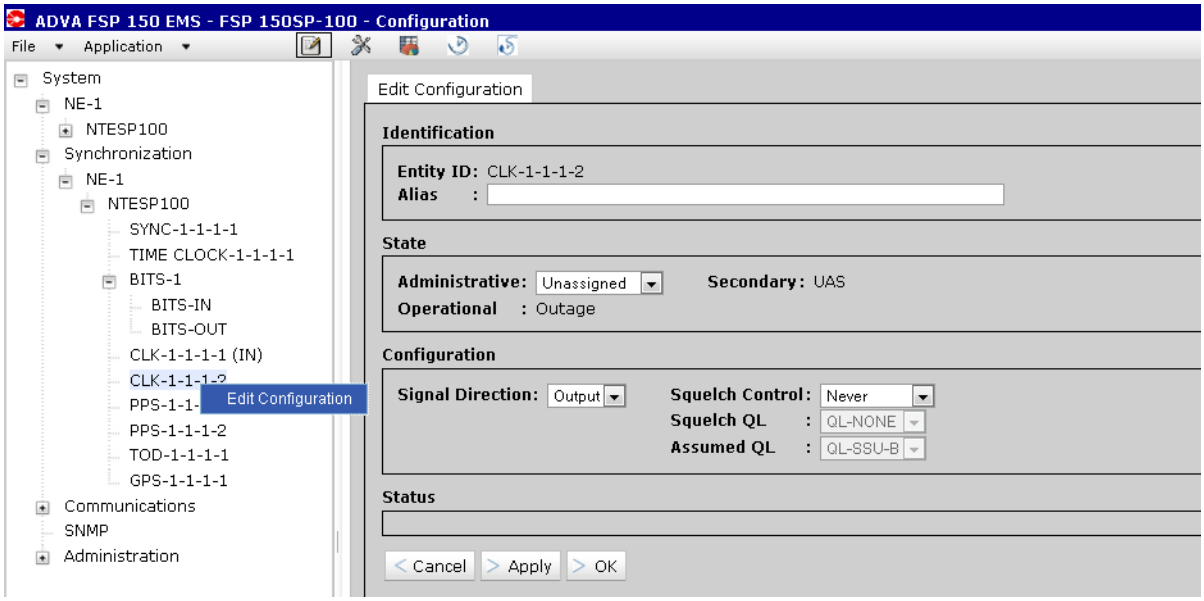
Note

CLK-1-1-1-1 is fixed as Input only. CLK-1-1-1-2 may be configured for Input or Output.

Step 12 Enter a right click on the CLK-1-1-1-1 or CLK-1-1-1-2 entity and select **Edit Configuration**.

An Edit CLK window displays

Figure 88: Edit CLK Interface Configuration



Step 13 Enter the following 10MHz Clock options:

a) Enter the desired Alias and select the desired Administrative state

b) Select the desired Signal Direction

c) For an Output CLK, select the desired Squelch Control and Squelch QL options

d) For an Input CLK, select the desired Assumed QL

e) Select **OK**

Step 14 Select the CLK-1-1-1-1 or CLK-1-1-1-2 entity to view configuration details.

Step 15 Go to Step 2.

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Edit PPS Port(s)

Refer to the following procedure for provisioning the Pulse Per Second (PPS) port(s).

Note

PPS-1-1-1-1 is fixed as Input only. PPS-1-1-1-2 may be configured for Input or Output.

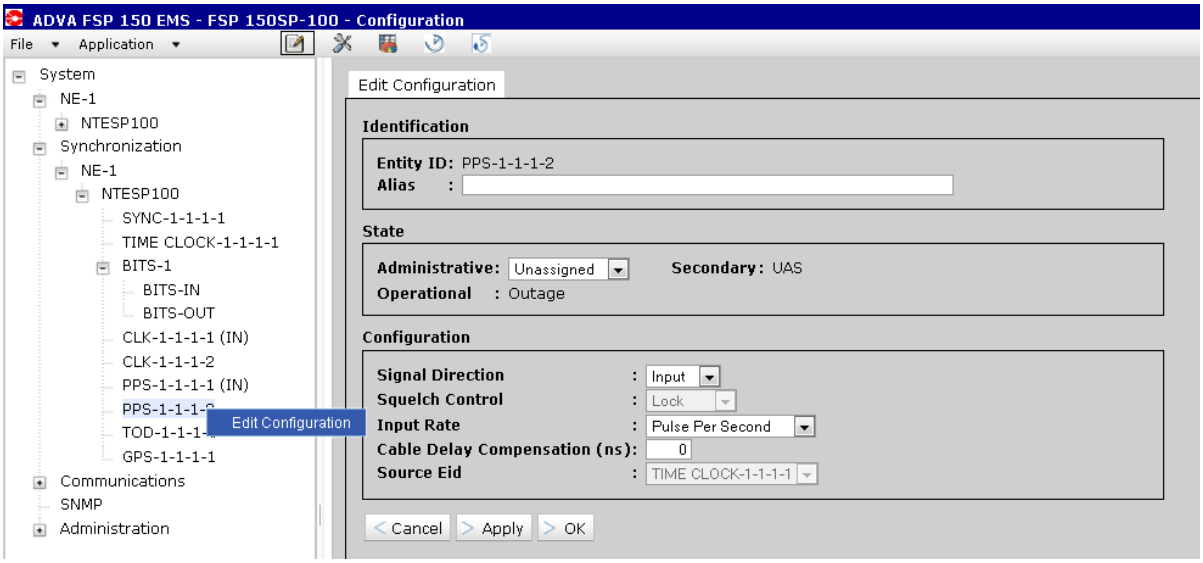
Note

If PPS is to be provisioned for Output signal direction, the desired Source EID must be provisioned prior to selecting its entity as an output source.

Step 16 Enter a right click on the PPS-1-1-1-1 or PPS-1-1-1-2 entity and select **Edit Configuration**.

An Edit PPS window displays

Figure 89: Edit PPS-1-1-1-2 Interface Configuration



Step 17 Enter the following PPS options:

a) Enter the desired Alias and select the desired Administrative state

b) For PPS-1-1-1-2: Select the desired Signal Direction

c) For PPS-1-1-1-2 provisioned as an Output PPS: Select the desired Squelch Control

d) For an Input PPS, select the desired Input Rate

e) Enter the desired Cable Delay Compensation (approx. 5ns per meter)

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f) For PPS-1-1-1-2 provisioned as an Output PPS: Select the desired Source EID

g) Select **OK**

Step 18 Select the PPS-1-1-1-1 or PPS-1-1-1-2 entity to view configuration details.

Step 19 Go to Step 2.

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Edit TOD Port

Refer to the following procedure for provisioning the Time Of Day (TOD) port.

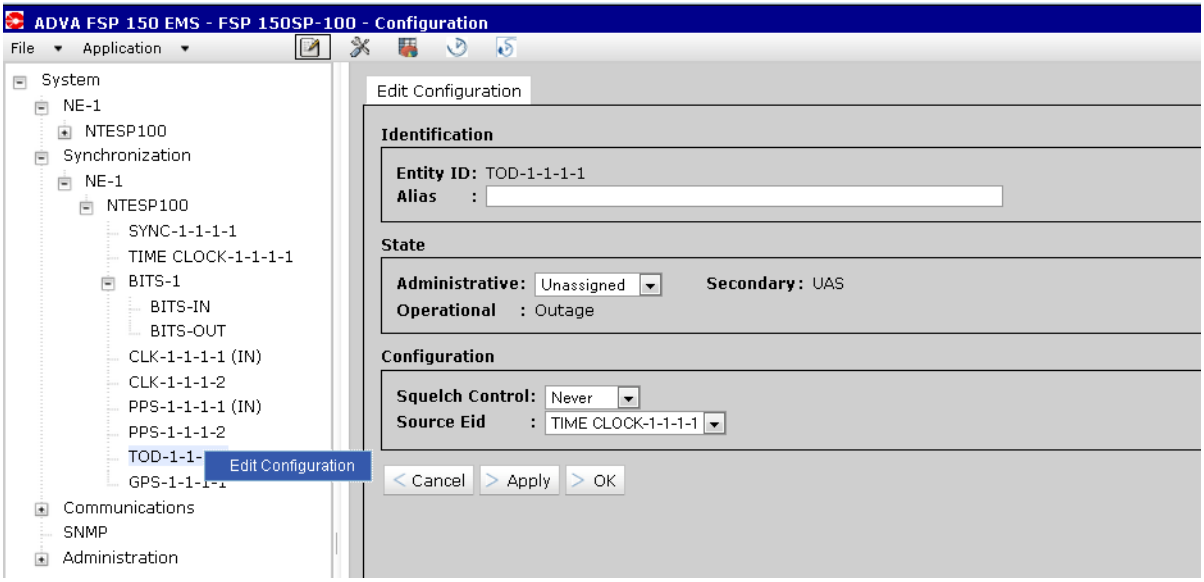
Note

The desired Source EID must be provisioned prior to selecting its entity as an output source.

Step 20 Enter a right click on the TOD-1-1-1-1 entity and select **Edit Configuration**.

An Edit TOD-1-1-1-1 window displays

Figure 90: Edit Time of Day Interface Configuration



Step 21 Enter the following TOD options:

a) Enter the desired Alias and select the desired Administrative state

b) Select the desired Squelch Control

c) Select the desired Source EID

d) Select **OK**

Step 22 Select the TOD-1-1-1-1 entity to view configuration details.

Step 23 Go to Step 2.

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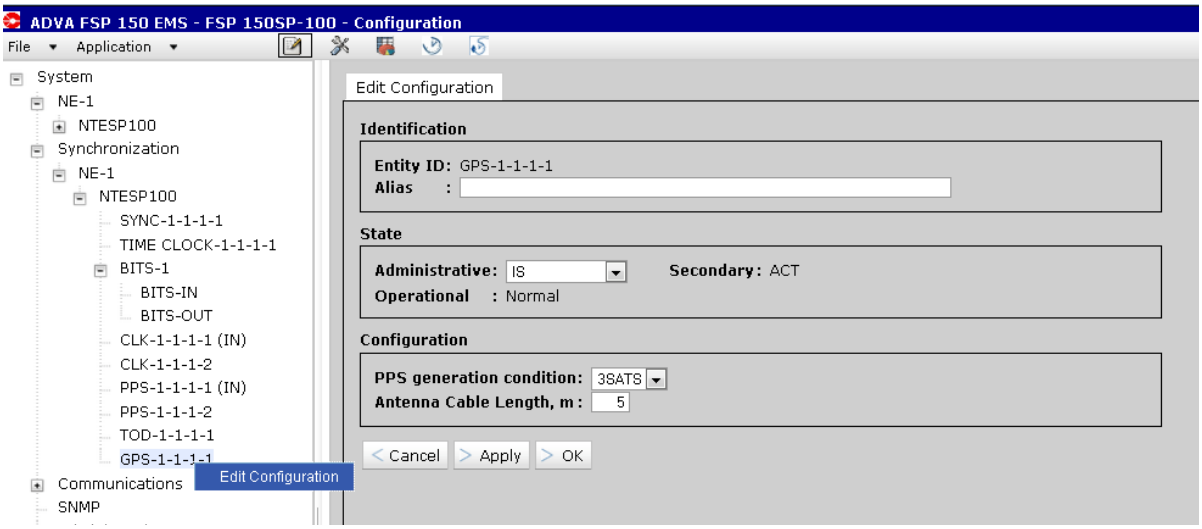
Edit GPS

Refer to the following procedure for provisioning the Global Positioning System (GPS) port.

Step 24 Enter a right click on the GPS-1-1-1-1 entity and select **Edit Configuration**.

An Edit GPS-1-1-1-1 window displays

Figure 91: Edit GPS Interface Configuration



Step 25 Enter the following GPS options:

a) Enter the desired Alias and select the desired Administrative state

b) Select the desired GPS generation condition

c) Enter the Antenna Cable Length in meters (4.5nsec/meter is assumed in cable delay calculation)

d) Select **OK**

Step 26 Select the GPS-1-1-1-1 entity to view configuration details and status.

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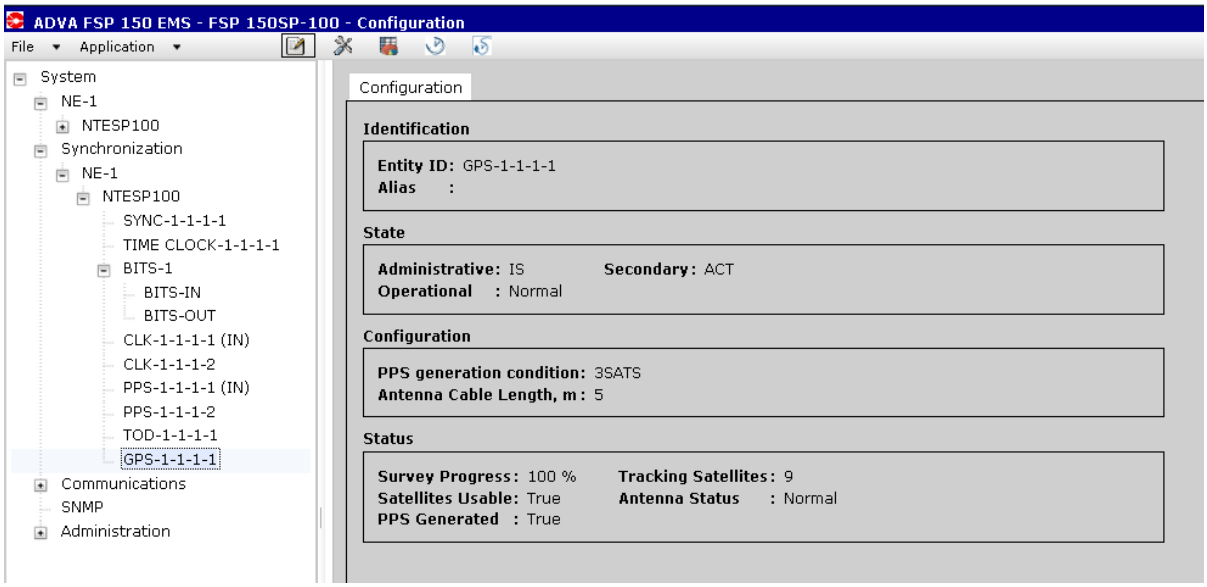
Figure 92: GPS Interface Configuration Details and Status



Step 27 Go to Step 2.

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Edit System Time of Day

The following procedure provides instructions for editing the System Time of Day using Local, NTP or PTP Clock configuration.

Step 28 Determine the next step.

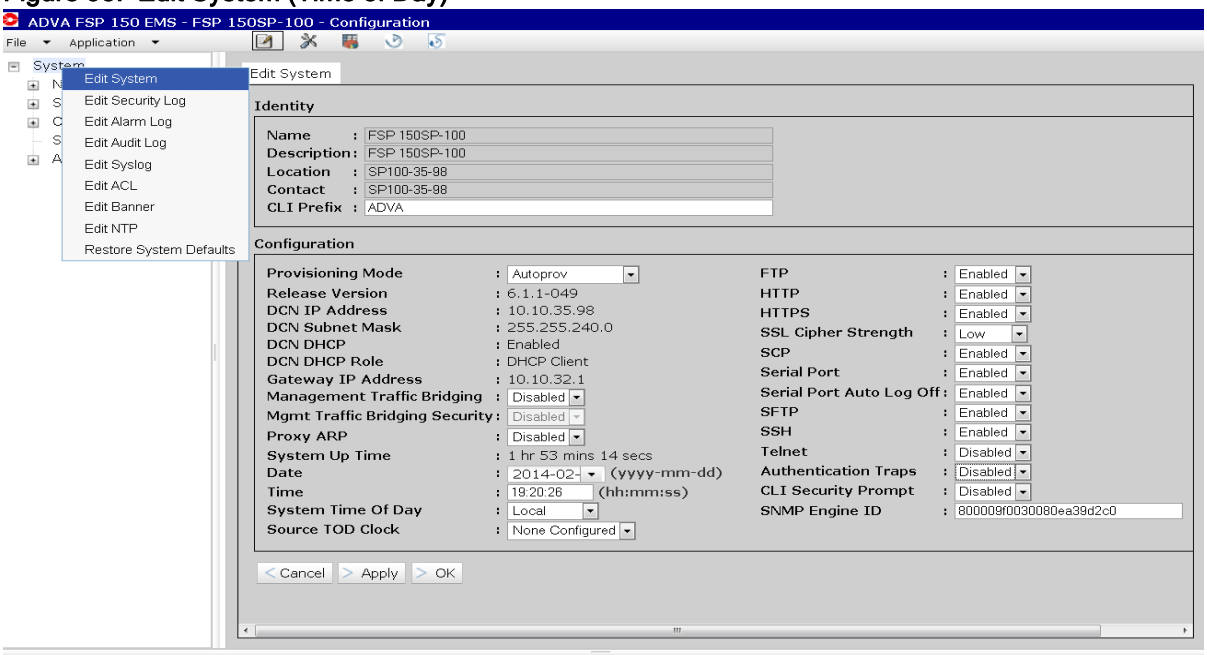
Current Status	Then
Edit System Time Of Day via local entry?	Continue with the next step.
Edit System Time Of Day via NTP?	Go to Step 35.
Edit System Time Of Day via PTP Clock?	Go to Step 40.

Edit System Time Of Day via Local Entry

Step 29 Enter a right click on the System entity and select **Edit System**.

An Edit System window displays

Figure 93: Edit System (Time of Day)



Step 30 For System Time Of Day, select Local.

Step 31 Select the drop down calendar for the Date and select the appropriate year, month and day.

Note

Three years are displayed at a time. To progress through the years beyond the displayed years, continue to click on the right most years until the desired year is displayed. Then select the desired year. Then select the desired month from the drop down list. Then select the desired date.

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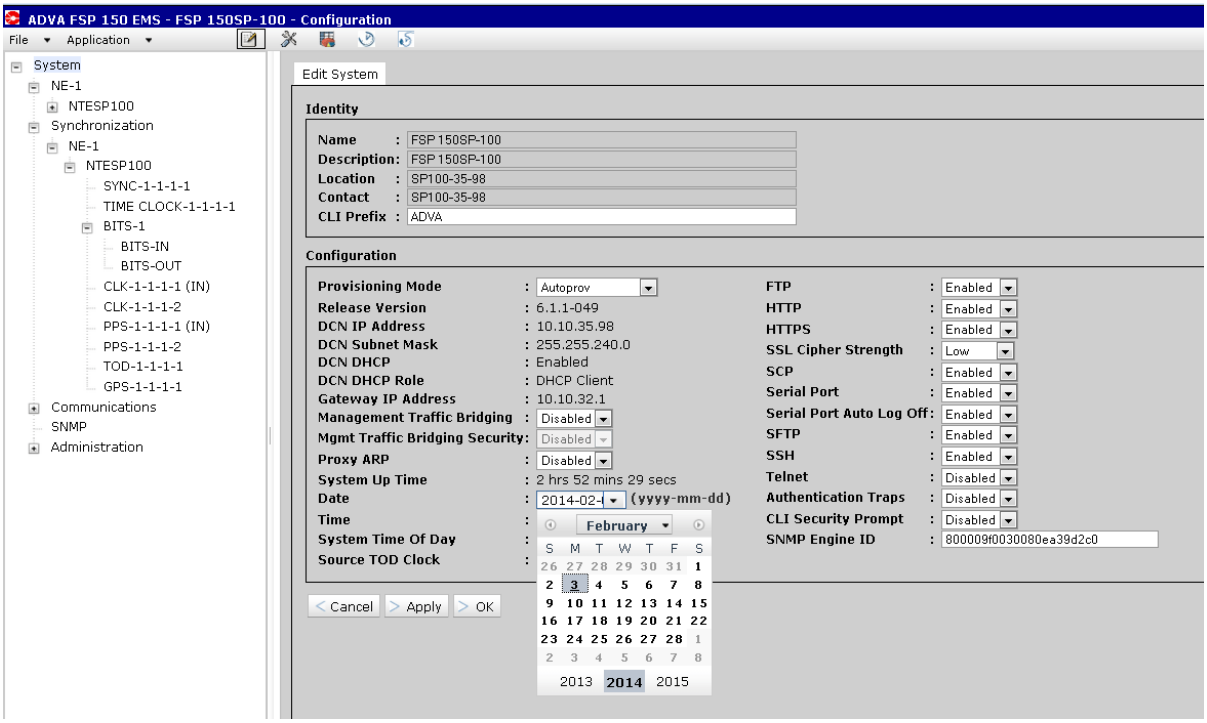
Figure 94: Edit System Time Of Day - Local Method



Step 32 Enter the appropriate time in (hh:mm:ss) and select **OK**.

Step 33 Select the Identification tab to view the local entry.

Step 34 Go to Step 2.

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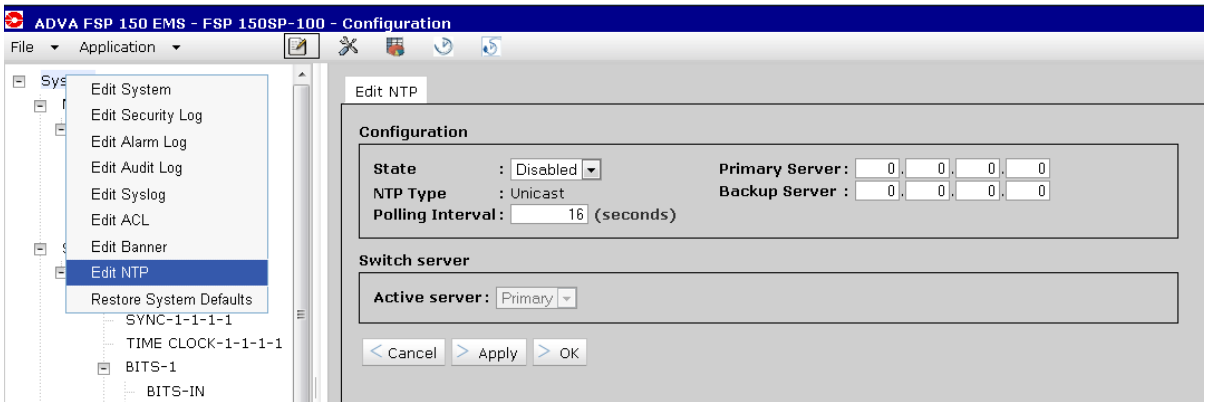
Edit System Time Of Day via NTP

Step 35 Enter a right click on the System entity and select **Edit NTP**.

An Edit NTP window displays

Figure 95: Edit System Time Of Day - NTP Method



Step 36 Select/enter the desired NTP options.

The Polling Interval can be set to 16, 32, 64, 128, 256, 512 or 1024 seconds. The default is 16 seconds.

Enter the corresponding IP address for Primary Server and, if applicable, the Backup Server

If both a Primary and Backup Server are configured, either one can be made Active by selecting the desired Active server.

Select OK.

The display updates to show the edited information

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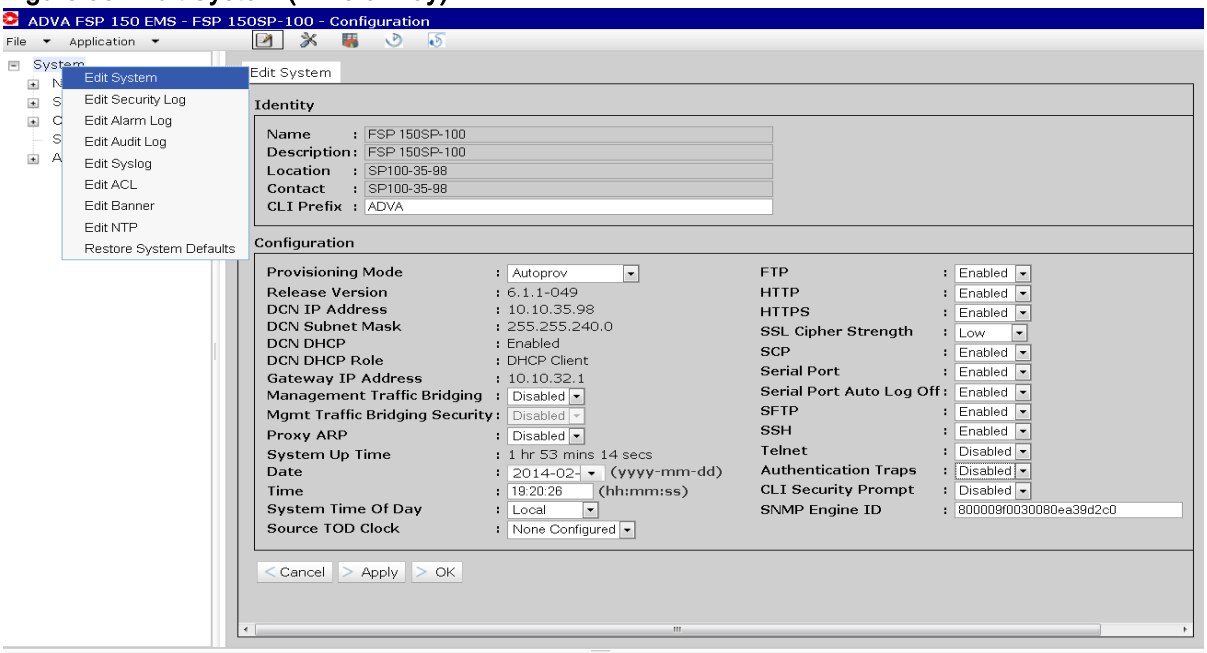
Step 37 Enter a right click on the System entity and select **Edit System**.

An Edit System window displays

Figure 96: Edit System (Time of Day)



Step 38 For System Time Of Day, select NTP and select OK.

Step 39 Go to Step 2.

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Edit System Time Of Day via PTP Clock

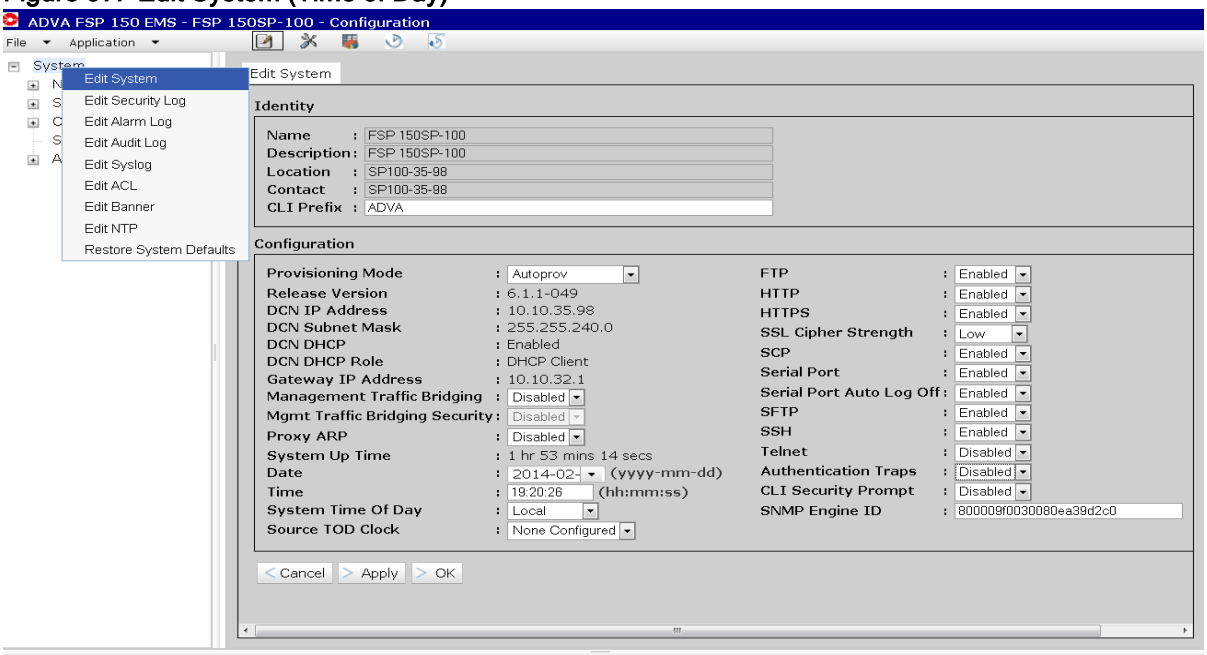
Note

If the source TOD clock is to be set to PTP Clock, then the Telecom Slave must be provisioned and In Service prior to selecting its entity as a source. See “Provision Precision Time Protocol (PTP)” on p. 208.

Step 40 Enter a right click on the System entity and select **Edit System**.

An Edit System window displays

Figure 97: Edit System (Time of Day)



Step 41 Enter the following System TOD options:

a) Select PTP Clock for System Time of Day

b) Select TS-1-1 for the Source TOD Clock

c) Select **OK**

Step 42 Select the Identification tab to view Date and Time.

Step 43 Go to Step 2.

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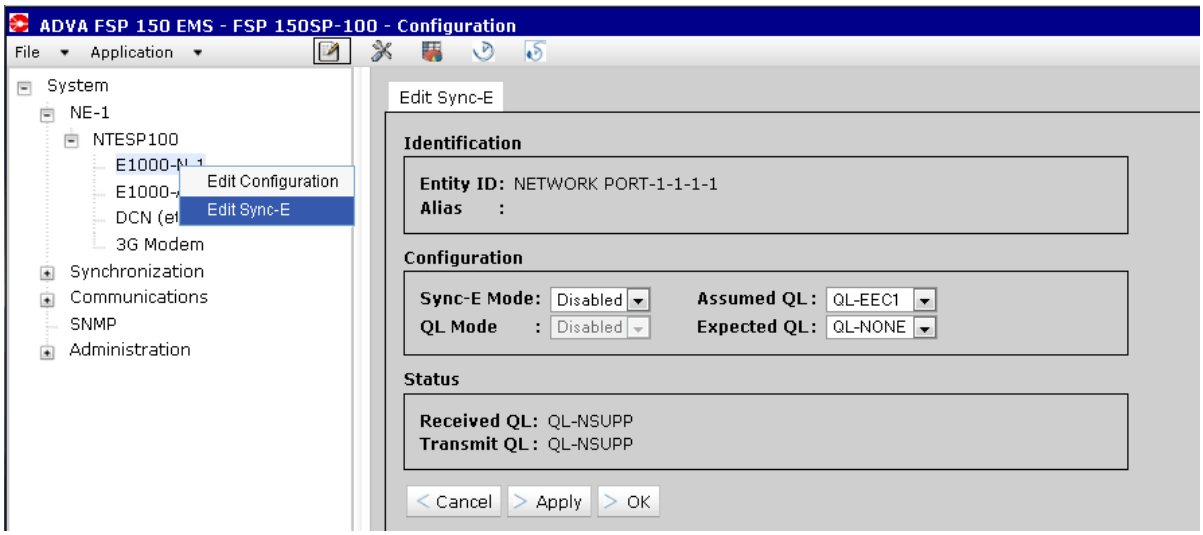
Edit Sync-E on a Network Port or Access Port

Step 44 Expand the NE-1 (directly underneath the System entity) and NTESP100 entities in the selection tree pane. Right click on the desired Network or Access Port and select **Edit Sync-E**. A screen similar to the following displays (see Figure 98 on p. 202):

Note

If the port is an Access Port configured as a 1000Base-T electrical interface, then it must be configured as “Auto 1000 Full Slave”.

Figure 98: Edit Sync-E - Network Port



Step 45 Select the desired Configuration settings for Sync-E Mode, QL Mode, Assumed QL and Expected QL.

Note

If using SDH (Option-1), and QL Mode is disabled, an Assumed QL other than None must be selected.

Click on **OK**.

Step 46 Determine the next step.

Desired Function	Then
Are there other Network or Access Ports to configure for Sync-E?	Go to Step 44.
Add Sync-E reference(s)?	Go to Step 47.
Other?	Go to Step 2.

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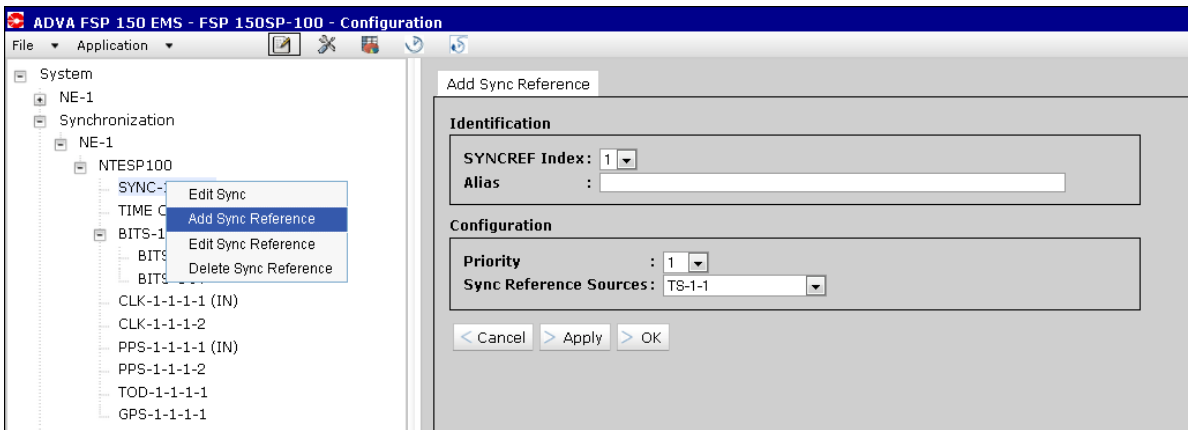
Add a Sync Reference

Step 47 For Network Ports / Access Ports, Telecom Slave, BITS-IN: Right click on the System Sync Domain (SYNC-1-1-1-1) and select **Add Sync Reference**.

The following screen displays:

Figure 99: Add Sync Reference



Step 48 Enter an Alias if desired.

Select the desired Priority Value from the drop-down list.

Select the desired Sync Reference Source from the drop-down list.

Note

For Network and Access Ports to appear in the Sync Reference Sources list they must be configured as fiber.

For any interface to appear in the Sync Reference Sources list, it must have Sync-E Mode enabled and the interface must not be Unassigned.

Click on **OK**.

Step 49 Repeat Step 47 and Step 48 for each additional Sync entity.

Step 50 For Network Port / Access Port, Telecom Slave, BITS-IN: Select the System Sync Domain entity (SYNC-1-1-1-1) and the Status tab.

The Synchronization Reference List displays the status of each Sync Reference Identifier

Step 51 Go to Step 2.

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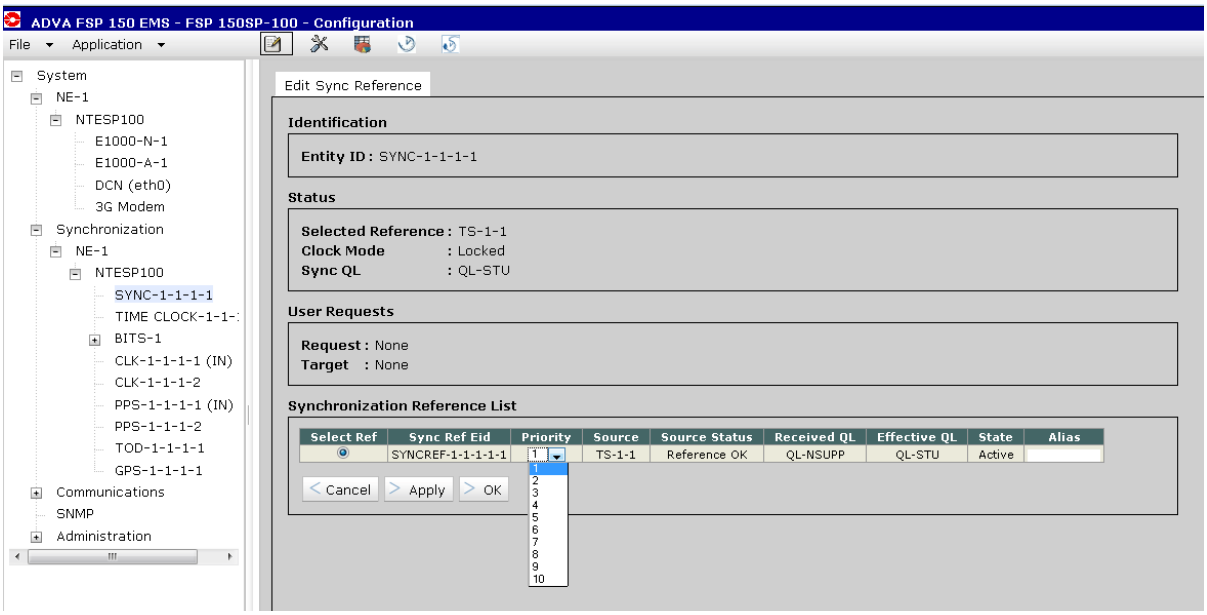
Edit a Sync Reference

Step 52 For Network Port / Access Port: Right click on the System Sync Domain (SYNC-1-1-1-1) and select **Edit Sync Reference**.

The following screen displays:

Figure 100: Edit Sync Reference



Step 53 Select the Radio Button for the Source to edit, then select the desired Priority from the drop-down list.

Click on **OK**.

Step 54 Go to Step 2.

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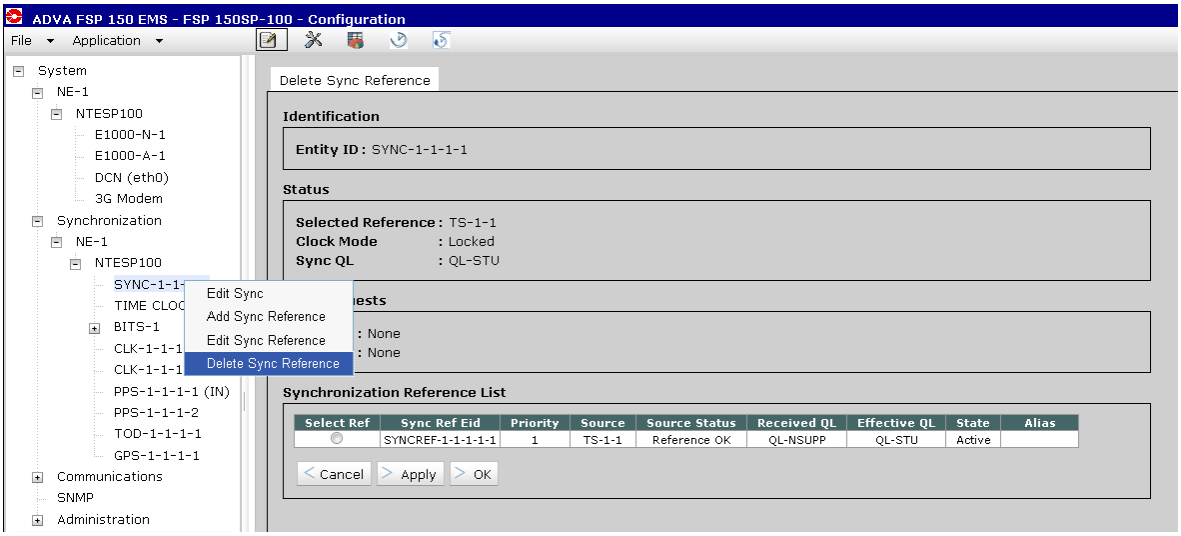
Delete a Sync Reference

Step 55 For Network Port / Access Port: Right click on the System Sync Domain (SYNC-1-1-1-1) and select **Delete Sync Reference**.

The following screen displays:

Figure 101: Delete Sync Reference



Step 56 Select the Radio Button for the Source to delete.

Click on **OK**.

Step 57 Go to Step 2.

End of Procedure

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Enable Software Licensing for SyncJack / PTP Feature(s)

The following Software Licensing Options are available:

- **PTP-MC/BC** enables/disables Master Clock/Boundary Clock license. This license supports 1 Clock Probe, 1 PTP Clock Probe,1 PTP Network Probe and up to 4 remote slaves at the maximum PTP message rate.
- **SyncJack-Extended-Scaled**, can be enabled if the PTP-MC/BC feature is enabled, and enabled extends the maximum number of SyncJack probes that may be created. When enabled, will allow the creation of up to 2 Clock Probes, 4 PTP Clock Probes and 1 PTP Network Probe.
- **PTP-Extended-Remote-Slaves** can be enabled if the PTP-MC/BC feature is enabled, and extends the number of remote slaves from 4 to up to 16 at the maximum PTP message rate or 32 at the PTP message rate of up to 64 packets per second.

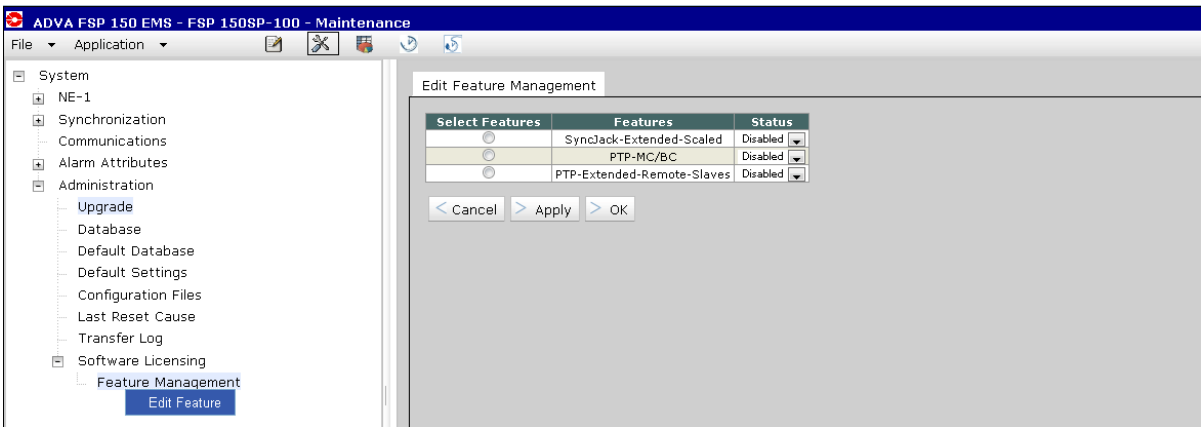
Procedure

Step 1 Select the Maintenance Application on the tool bar or select Maintenance from the Application Menu. Expand the System, Administration and Software Licensing entities in the selection tree pane, by clicking on the “+” signs next to each entity to expand each view.

Step 2 Enter a right click on Feature Management and select Edit Feature.

An Edit Feature Management screen displays

Figure 102: Edit Feature Management



Step 3 Select the radio button associated with the desired feature.

If enabling a license, a License Warning window appears

Step 4 Select **OK**.

Step 5 Set the feature Status to Enabled and select **OK**

The Feature Management Status is displayed and indicates it is in the enabled state

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Step 6 Select **OK**.

Step 7 Repeat Step 2 through Step 6 for each additional desired feature.

End of Procedure

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Provision Precision Time Protocol (PTP)

This section provides Precision Time Protocol (PTP) related configuration, including:

- Telecom Slave (TS)
- Boundary Clock (BC)
- Remote Slave (Static Slave or Dynamic Slave)
- Master Clock (MC)
- Time Clock and add a Time Clock Reference

Telecom Slave Provisioning Order

A single Telecom Slave may be created for the system. The Telecom Slave and associated timing functions are created in the following order:

- Enable Software Licensing for Syncjack/PTP features
- Ensure that the Port associated with the PTP Flow Point is In Service
- Edit an Ethernet Port's Delay Asymmetry setting
- Create a Telecom Slave
- Create / Edit a Slave Only Ordinary Clock (SOOC)
- Create / Edit a PTP Flow Point (PTPFP)
- Create / Edit an Ordinary Clock Slave (OCS) Port

The TS, once provisioned and Locked (the OCS Port State changes to Slave state), may be:

- added as a Sync Reference to the System Sync Domain (SYNC-1-1-1-1)
- selected as a timing source for Boundary Clock and/or Time Clock. (These entities should be disabled until the OC-S has achieved lock [OCS Port State=Slave].)
- selected as an output reference for the PPS (PPS-1-1-1-1), or Time of Day (TOD-1-1-1-1) output ports.
- selected as the Source TOD Clock of System Time of Day (ToD)

Boundary Clock Provisioning Order

A Boundary Clock and Master Clock cannot co-exist. Only one or the other may be provisioned and In Service at a time.

PTP configuration options are created in the following order for Boundary Clock:

- Enable Software Licensing for Syncjack/PTP features
- Ensure that the Port associated with the PTP Flow Point is In Service
- Edit an Ethernet Port's Delay Asymmetry setting
- Create / Edit a Telecom Slave

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- Create / Edit a Boundary Clock
- Create / Edit a Master Clock Interface
- Create / Edit a PTP Flow Point (PTPFP)
- Create / Edit a Master Virtual Port
- Create / Edit a Static Slave or Edit / Delete a Dynamic Slave

Master Clock Provisioning Order

A Boundary Clock and Master Clock cannot co-exist. Only one or the other may be provisioned and In Service at a time.

PTP configuration options are created in the following order for Master Clock:

- Enable Software Licensing for Syncjack/PTP features
- Ensure that the Port associated with the PTP Flow Point is In Service
- Edit the Time Clock
- Add a Time Clock Reference
- Create / Edit a Master Clock
- Create / Edit a Master Clock Interface
- Create / Edit a PTP Flow Point (PTPFP)
- Create / Edit a Master Virtual Port
- Create / Edit a Static Slave or Edit / Delete a Dynamic Slave

The provisioning steps described in this section are performed using the PTP application (located on the Tool Bar or selectable via the Application menu) once the license of this feature has been turned on.

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on with at least a Provisioning level user permissions using eVision.

Note

This Procedure is written as a stand-alone operation for configuring PTP, but is also called out as a part of the Synchronization procedure (see “Provision Synchronization” on p. 186).

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Procedure

Step 1 Determine the next step.

Desired Function	Then
Enable Software Licensing for SyncJack / PTP feature(s)?	See "Enable Software Licensing for SyncJack / PTP Feature(s)" on p. 206.
Edit an Ethernet Port's Delay Asymmetry setting?	Go to Step 20.
Create a Telecom Slave?	Go to Step 2.
Add a Telecom Slave to a Sync Reference?	See "Add a Sync Reference" on p. 203.
Associate the Telecom Slave to the ToD Output?	See "Edit TOD Port" on p. 194.
Associate the Telecom Slave to the PPS Output?	See "Edit PPS Port(s)" on p. 192.
Create a Boundary Clock?	Go to Step 23.
Edit the Time Clock?	Go to Step 38.
Add a Time Clock Reference?	Go to Step 43.
Associate the PTP Clock to the System ToD?	See "Edit System Time of Day" on p. 197.
Create a Master Clock?	Go to Step 49.
Create Static Slave?	Go to Step 64.
Verify a Dynamic Slave connectivity?	Go to Step 71.
All PTP provisioning is completed?	End of Procedure

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Create a Telecom Slave

Note

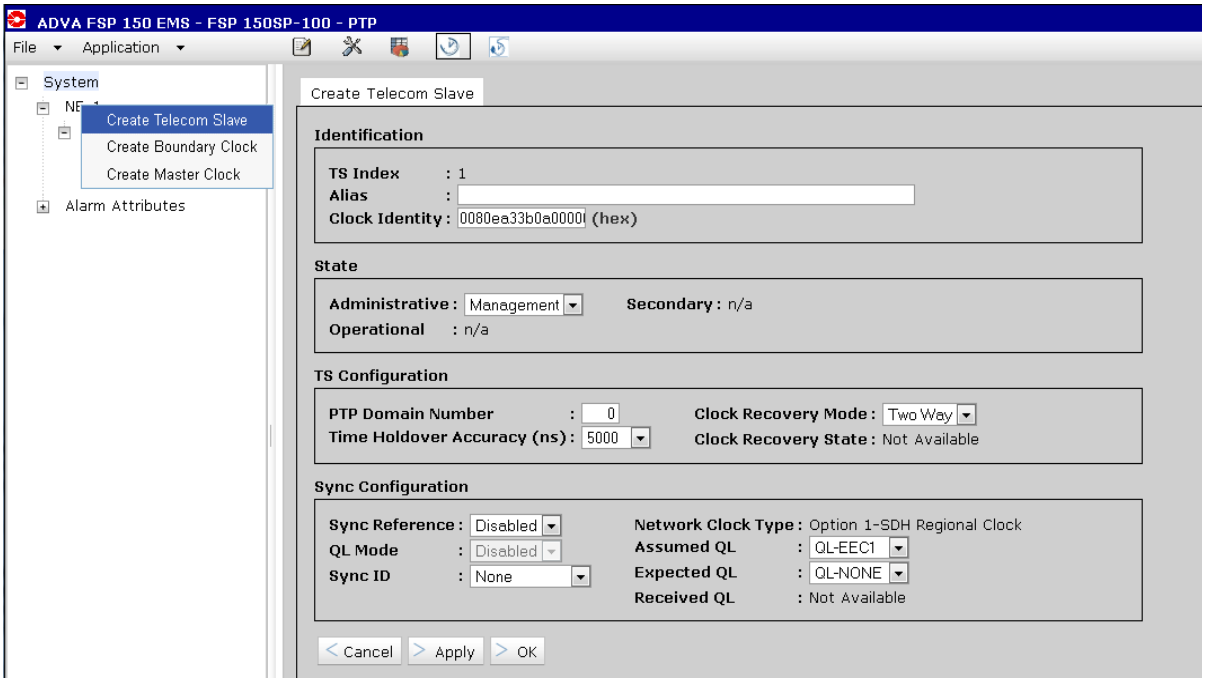
Prior to creating a Telecom Slave, the appropriate Network / Access port(s) for the PTP Flow Point(s) should already have been provisioned and In Service, and the Master Clock device has been provisioned and tested.

Step 2 Select the PTP Application on the tool bar or select PTP from the Application Menu. Expand the System and NE-1 entities in the selection tree pane, by clicking on the “+” signs next to each entity to expand each view.

Step 3 Enter a right click on the NE-1 entity and select **Create Telecom Slave**.

A Create Telecom Slave window displays

Figure 103: Create Telecom Slave



Step 4 Enter the following Telecom Slave options:

a) Enter the desired Alias and Clock Identity

b) Select the desired Administrative State

c) Enter the desired PTP Domain Number

d) Select the desired Time Holdover Accuracy (in nanoseconds) and Clock Recovery Mode: (One Way (frequency) or Two Way (frequency and phase)

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e) Select the desired Sync Configuration options (Sync ID is the PTP reference clock and can be free running (None) or the Sync clock (SYNC-1-1-1-1)

f) Select **OK**.

A TS entity appears under the Ethernet Ports in the selection tree pane

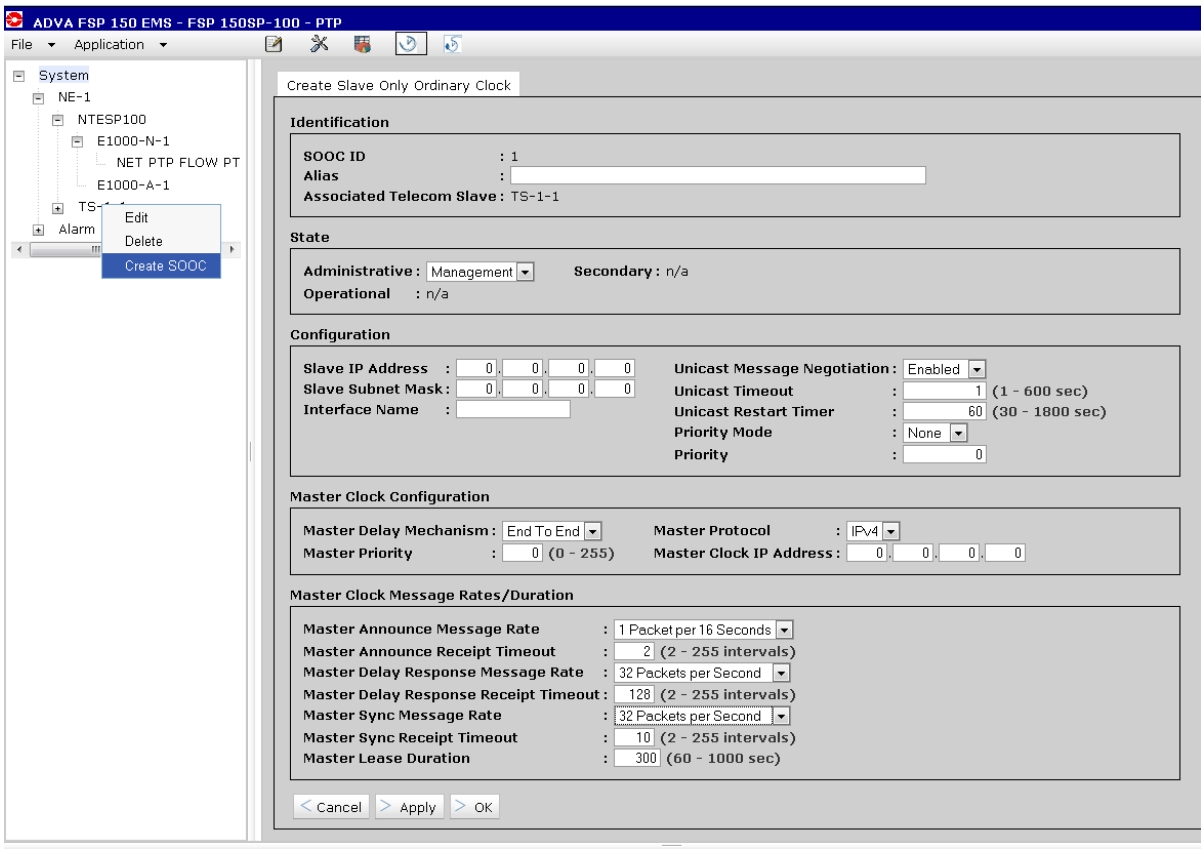
Step 5 Select the TS entity to view configuration details.

Create a Slave Only Ordinary Clock

Step 6 Enter a right click on the Telecom Slave entity (TS-1-1) and select **Create SOOC**.

A Create Slave Only Ordinary Clock window displays

Figure 104: Create Slave Only Ordinary Clock


ADVA FSP 150 EMS - FSP 150SP-100 - PTP
File
Application
System
NE-1
NTESP100
E1000-N-1
NET PTP FLOW PT
E1000-A-1
Alarm
Edit
Delete
Create SOOC
Create Slave Only Ordinary Clock
Identification
SOOC ID : 1
Alias :
Associated Telecom Slave : TS-1-1
State
Administrative : Management
Secondary : n/a
Operational : n/a
Configuration
Slave IP Address : 0 . 0 . 0 . 0
Slave Subnet Mask : 0 . 0 . 0 . 0
Interface Name :
Unicast Message Negotiation : Enabled
Unicast Timeout : 1 (1 - 600 sec)
Unicast Restart Timer : 60 (30 - 1800 sec)
Priority Mode : None
Priority : 0
Master Clock Configuration
Master Delay Mechanism : End To End
Master Priority : 0 (0 - 255)
Master Protocol : IPv4
Master Clock IP Address : 0 . 0 . 0 . 0
Master Clock Message Rates/Duration
Master Announce Message Rate : 1 Packet per 16 Seconds
Master Announce Receipt Timeout : 2 (2 - 255 intervals)
Master Delay Response Message Rate : 32 Packets per Second
Master Delay Response Receipt Timeout : 128 (2 - 255 intervals)
Master Sync Message Rate : 32 Packets per Second
Master Sync Receipt Timeout : 10 (2 - 255 intervals)
Master Lease Duration : 300 (60 - 1000 sec)
Cancel
Apply
OK

Step 7 Enter the following SOOC options:

a) Enter the desired Alias

b) Select the desired Administrative State

c) Select the Flow Identifier (fixed at None)

d) Enter the Slave IP address and subnet mask

e) Enter an Interface Name (mandatory)

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f) Enable or Disable Unicast Message Negotiation (for FSP150 Dynamic Remote Slave unit, Enable Unicast Message Negotiation)

g) Enter the desired Unicast Timeout and Unicast Restart Timer

h) Select the desired Priority Mode and enter the desired Priority

i) Select the Master Clock Type and Master Delay Mechanism

j) Enter the Master Priority

k) Select the Master Protocol type and enter the Master Clock IP Address

l) Select the desired Master Clock Message Rates/Duration/Timeout options

m) Select **OK**.

An SOOC entity appears below the Telecom Slave entity in the selection tree pane

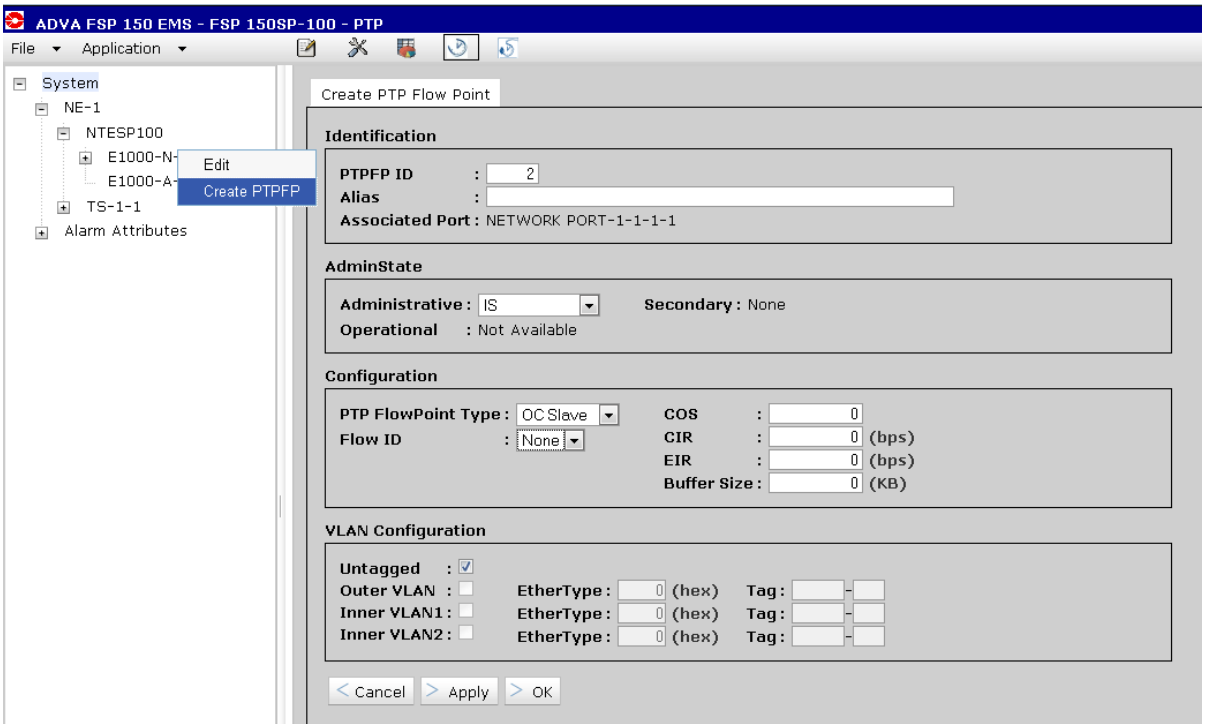
Step 8 Select the SOOC entity to view configuration details.

Create a PTP Flow Point

Step 9 Expand the NTESP100 entity. Enter a right click on the Network or Access Port associated with the Flow for the clock source and select **Create PTPFP**.

A Create PTP Flow Point screen displays

Figure 105: Create PTP Flow Point



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Step 10 Enter the following PTP Flow Point options:

a) Enter the desired PTPFP ID and Alias

b) Select the desired Administrative State

c) For Boundary Clock / Master Clock: set the PTP Flow Point Type to OC Master.
For Slave: set the PTP Flow Point Type to OC Slave.

d) Enter the desired COS, CIR, EIR and Buffer Size.

e) Deselect the Untagged frame check box if Inner and/or Outer VLAN tags need to be entered. Select the desired Inner/Outer VLAN tag check box(es) to allow tag entry, then enter the desired EtherType and VLAN Tag(s)

f) Select **OK**.

A PTP FLOW PT entity appears below the associated Ethernet Port entity in the selection tree pane

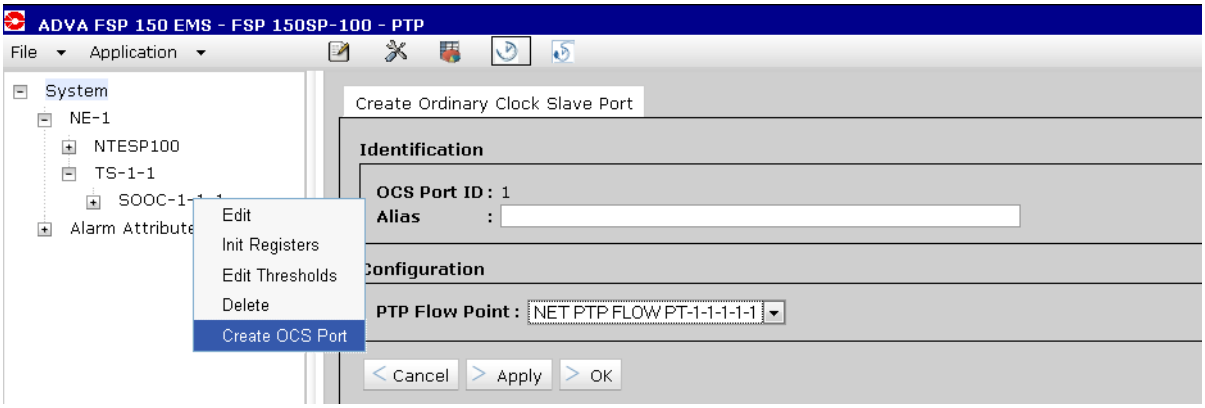
Step 11 Select the PTP FLOW PT entity and Configuration tab to view configuration details.

Create Ordinary Clock Slave Port

Step 12 Enter a right click on the SOOC entity and select **Create OCS Port**.

A Create Ordinary Clock Slave Port screen displays

Figure 106: Create Ordinary Clock Slave Port



Step 13 Enter the following OCS Port options:

a) Enter the desired Alias

b) Select the PTP Flow Point associated with the clock source

c) Select **OK**.

An OCS PORT entity appears below the associated SOOC entity in the selection tree pane

Step 14 Select the OCS PORT entity to view configuration details and Port State.

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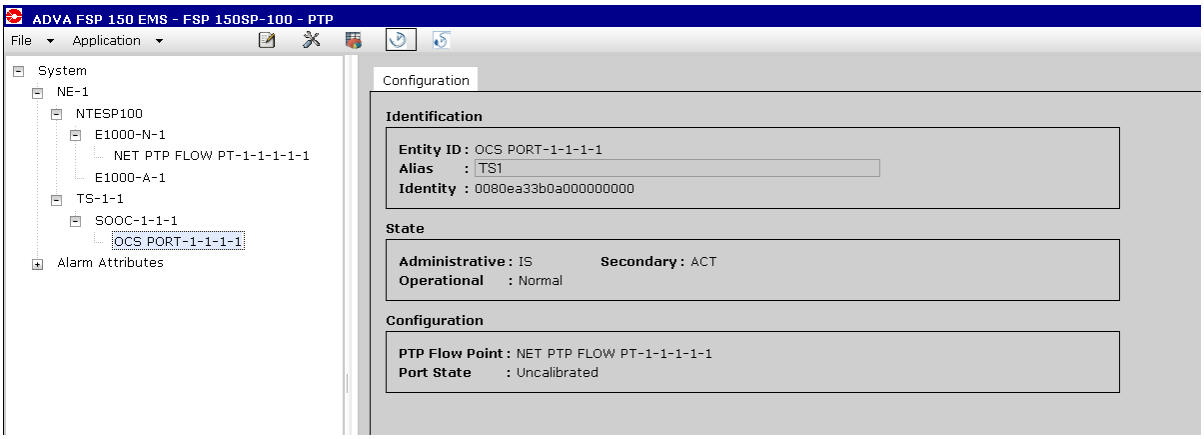
Note

The OC-S recovered clock will achieve lock to the selected Master Clock within 5 minutes to 60 minutes, depending on network conditions. If no messages have been received, the Port State is **Listening**. Once messages have been received from the Master Clock the Port State changes to **Uncalibrated**. When the system determines it is able to calibrate time, then the Port State changes to **Slave** when the TS is locked to the Master (Locked).

Figure 107: OCS Port Configuration Status (Unclalibrated)



Step 15 Select the PTP Flow Point entity and Statistics tab to view PM data. Ensure that messages are being received, otherwise troubleshoot accordingly.

Current PTP statistics are displayed

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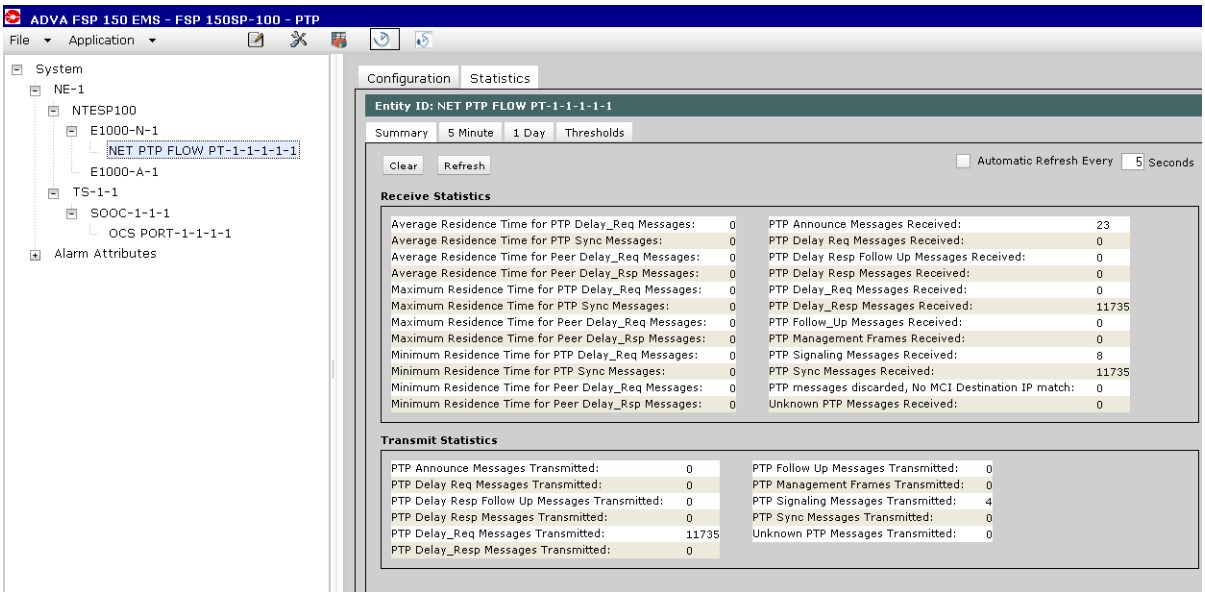
Figure 108: Network Port PTP Flow Point Statistics


ADVA FSP 150 EMS - FSP 150SP-100 - PTP
File
Application
System
NE-1
NTESP100
E1000-N-1
NET PTP FLOW PT-1-1-1-1-1
E1000-A-1
TS-1-1
SOOC-1-1-1
OCS PORT-1-1-1-1
Alarm Attributes
Configuration
Statistics
Entity ID: NET PTP FLOW PT-1-1-1-1-1
Summary
5 Minute
1 Day
Thresholds
Clear
Refresh
Automatic Refresh Every
5
Seconds
Receive Statistics
Average Residence Time for PTP Delay_Req Messages: 0
Average Residence Time for PTP Sync Messages: 0
Average Residence Time for Peer Delay_Req Messages: 0
Average Residence Time for Peer Delay_Rsp Messages: 0
Maximum Residence Time for PTP Delay_Req Messages: 0
Maximum Residence Time for PTP Sync Messages: 0
Maximum Residence Time for Peer Delay_Req Messages: 0
Maximum Residence Time for Peer Delay_Rsp Messages: 0
Minimum Residence Time for PTP Delay_Req Messages: 0
Minimum Residence Time for PTP Sync Messages: 0
Minimum Residence Time for Peer Delay_Req Messages: 0
Minimum Residence Time for Peer Delay_Rsp Messages: 0
PTP Announce Messages Received: 23
PTP Delay Req Messages Received: 0
PTP Delay Resp Follow Up Messages Received: 0
PTP Delay Resp Messages Received: 0
PTP Delay_Req Messages Received: 0
PTP Delay_Resp Messages Received: 11735
PTP Follow_Up Messages Received: 0
PTP Management Frames Received: 0
PTP Signaling Messages Received: 8
PTP Sync Messages Received: 11735
PTP messages discarded, No MCI Destination IP match: 0
Unknown PTP Messages Received: 0
Transmit Statistics
PTP Announce Messages Transmitted: 0
PTP Delay Req Messages Transmitted: 0
PTP Delay Resp Follow Up Messages Transmitted: 0
PTP Delay Resp Messages Transmitted: 0
PTP Delay_Req Messages Transmitted: 11735
PTP Delay_Resp Messages Transmitted: 0
PTP Follow Up Messages Transmitted: 0
PTP Management Frames Transmitted: 0
PTP Signaling Messages Transmitted: 4
PTP Sync Messages Transmitted: 0
Unknown PTP Messages Transmitted: 0

Step 16 Select the SOOC entity, Statistics tab and Summary tab to view PM data. If required, select the Raw PTP Messages tab to view raw PTP messages. See the next two figures.

Figure 109: SOOC Statistics Tab

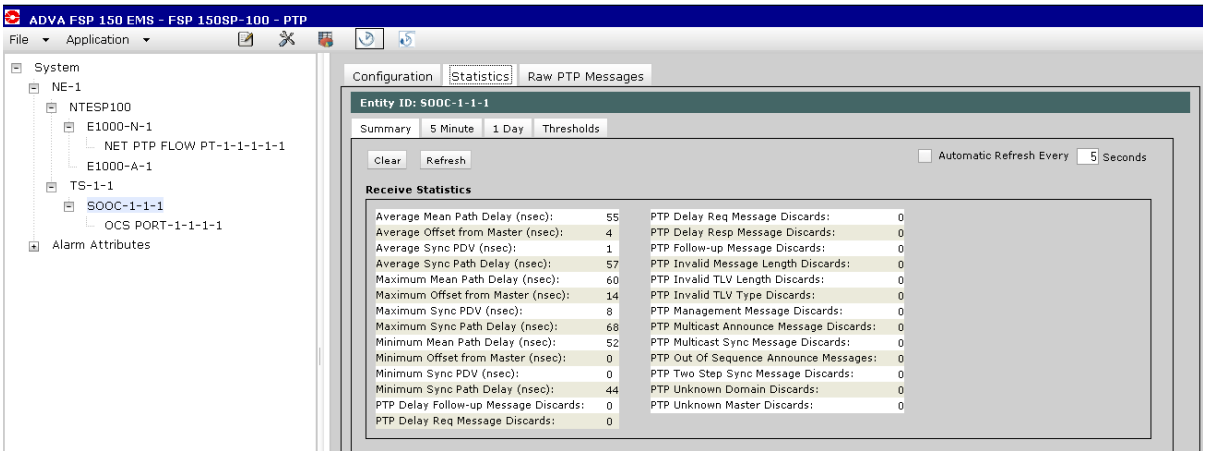


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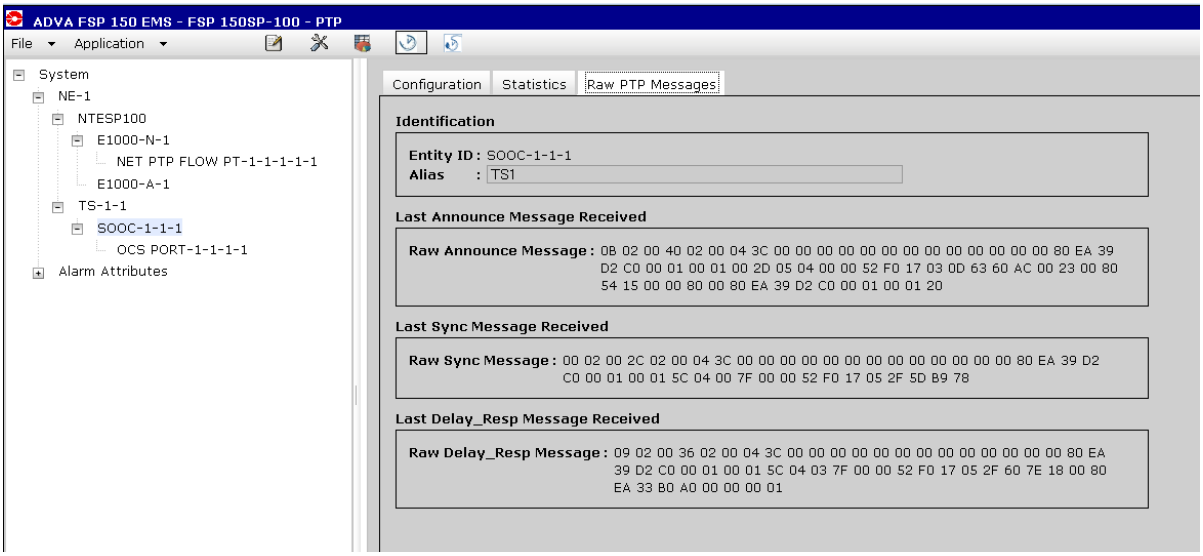
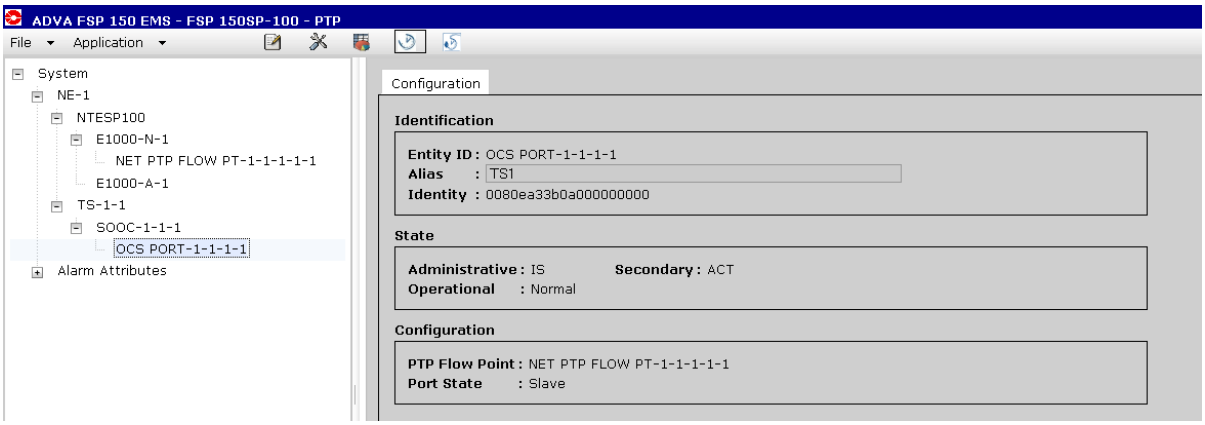
Figure 110: SOOC Raw PTP Messages


ADVA FSP 150 EMS - FSP 150SP-100 - PTP
File
Application
System
NE-1
NTESP100
E1000-N-1
NET PTP FLOW PT-1-1-1-1-1
E1000-A-1
TS-1-1
SOOC-1-1-1
OCS PORT-1-1-1-1
Alarm Attributes
Configuration
Statistics
Raw PTP Messages
Identification
Entity ID : SOOC-1-1-1
Alias : TS1
Last Announce Message Received
Raw Announce Message : 0B 02 00 40 02 00 04 3C 00 00 00 00 00 00 00 00 00 00 00 00 00 80 EA 39 D2 C0 00 01 00 01 00 2D 05 04 00 00 52 F0 17 03 0D 63 60 AC 00 23 00 80 54 15 00 00 80 00 80 EA 39 D2 C0 00 01 00 01 20
Last Sync Message Received
Raw Sync Message : 00 02 00 2C 02 00 04 3C 00 00 00 00 00 00 00 00 00 00 00 00 00 80 EA 39 D2 C0 00 01 00 01 5C 04 00 7F 00 00 52 F0 17 05 2F 5D B9 78
Last Delay_Resp Message Received
Raw Delay_Resp Message : 09 02 00 36 02 00 04 3C 00 00 00 00 00 00 00 00 00 00 00 00 00 80 EA 39 D2 C0 00 01 00 01 5C 04 03 7F 00 00 52 F0 17 05 2F 60 7E 18 00 80 EA 33 B0 A0 00 00 00 01

Step 17 Select the OCS PORT entity to view configuration details and Port State. Wait until the Port Status changes to Slave (Locked).

Figure 111: OCS Port Configuration Status (Slave)



Step 18 Go to Step 1.

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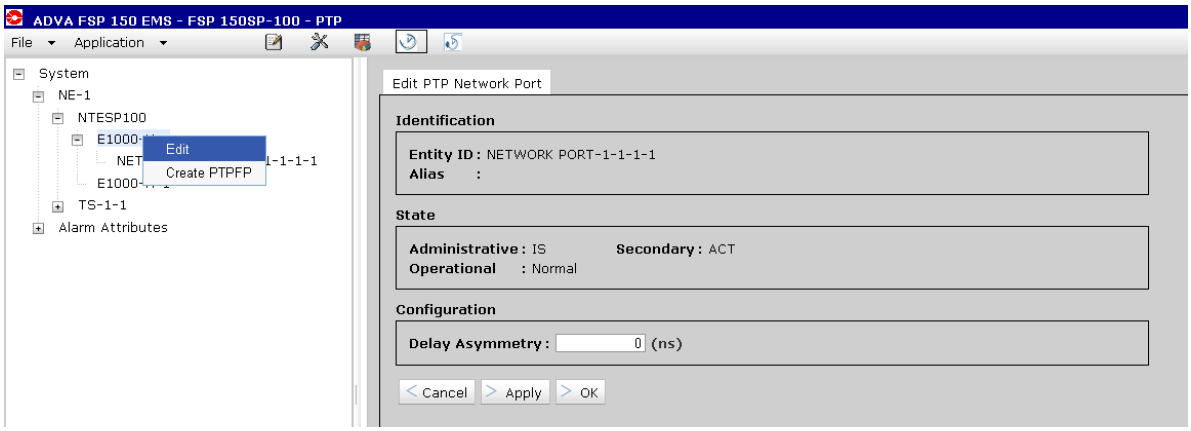
Edit an Ethernet Port's Delay Asymmetry Setting

Step 19 Select the PTP Application on the tool bar or select PTP from the Application Menu. Expand the System, NE-1 and NTESP100 entities in the selection tree pane, by clicking on the "+" signs next to each entity to expand each view.

Step 20 Enter a right click on the Ethernet Port entity and select **Edit**.

An Edit PTP Network or Access Port screen displays

Figure 112: Edit PTP Network Port Delay Asymmetry



Step 21 Enter the following desired delay value (in nanoseconds) and select **OK**.

Step 22 Go to Step 1.

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Create a Boundary Clock

Perform the following steps for creating a Boundary Clock.

Note

Prior to creating a Boundary Clock, the PTP-MC/BC feature must be enabled and a Telecom Slave must first be provisioned (Step 2 through Step 18).

Note

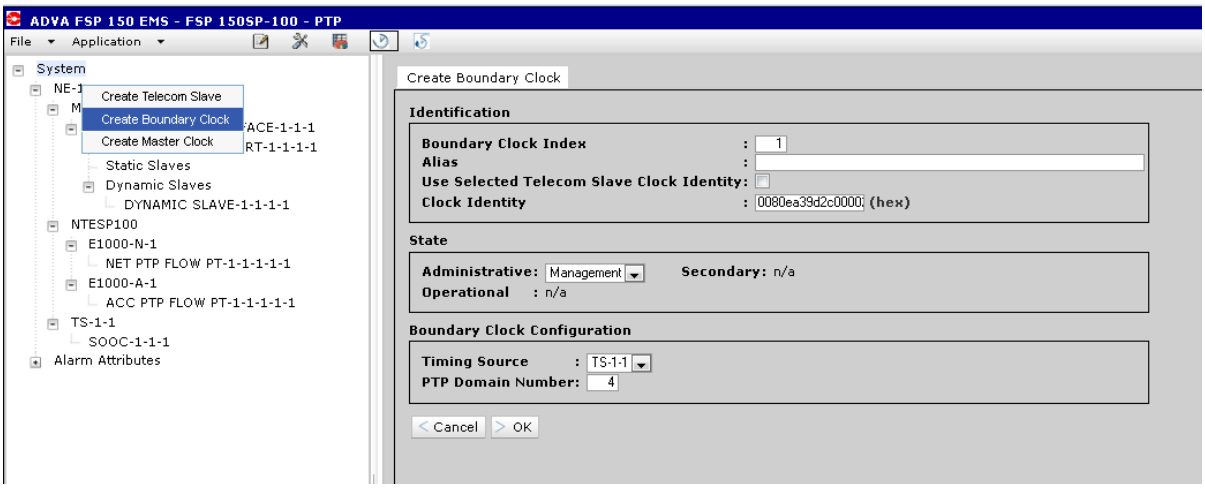
A Boundary Clock and Master Clock cannot co-exist. Only one or the other may be provisioned and In Service at a time.

Step 23 Select the PTP Application on the tool bar or select PTP from the Application Menu. Expand the System and NE-1 entities in the selection tree pane, by clicking on the “+” signs next to each entity to expand each view.

Step 24 Enter a right click on the NE-1 entity and select **Create Boundary Clock**.

A Create Boundary Clock window displays

Figure 113: Create Boundary Clock



Step 25 Enter the following Boundary Clock options:

a) Enter the desired Alias and Boundary Clock Index

b) Enter the Clock Identity or use the Clock Identity proposed by the node

c) Select “Use Selected Telecom Slave Clock Identity” if using Clock Identity from the selected Timing Source

d) Set the Administrative state to IS

e) Select the desired Timing Source and enter the desired PTP Domain Number

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f) Select **OK**

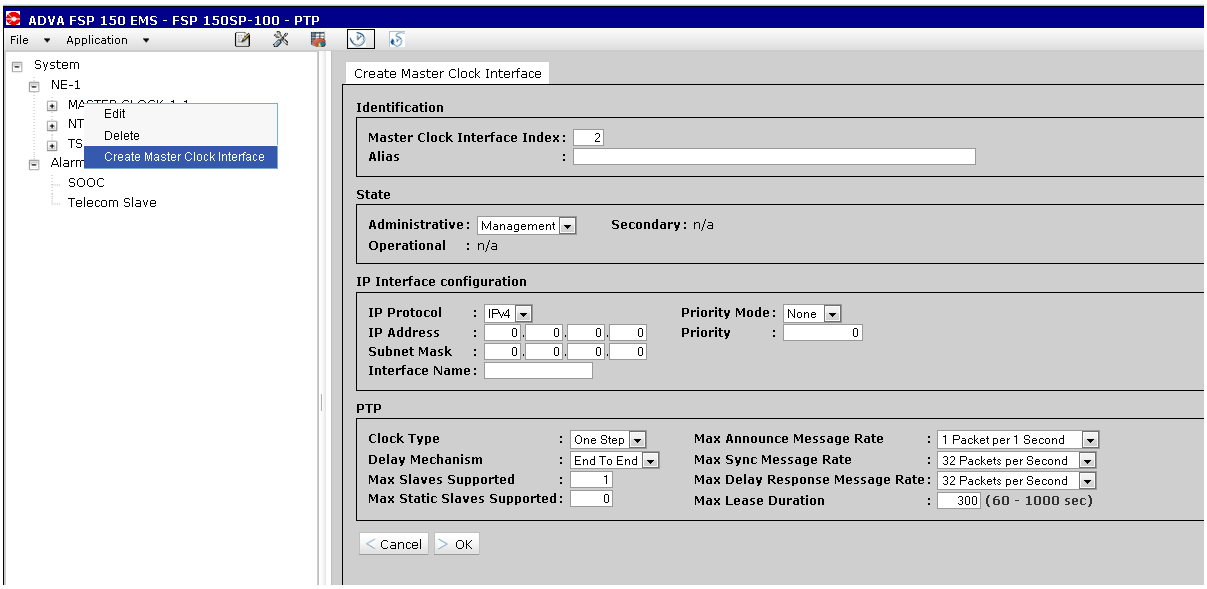
The Boundary Clock entity displays below the network element entity in the Selection Tree

Step 26 Select the Boundary Clock entity to verify entry details.

Step 27 Enter a right click on the Boundary Clock entity and select **Create Master Clock Interface**.

A Create Master Clock Interface window displays

Figure 114: Create Master Clock Interface (for Boundary Clock)



Step 28 Enter the following Master Clock Interface options:

a) Enter the desired Alias and Master Clock Interface Index

b) Set the Administrative state to IS

c) Select the desired IP Protocol

d) Enter the appropriate IP Address and Subnet Mask

e) Enter the Interface Name (mandatory)

f) Select/enter the desired Priority Mode and Priority

g) Select the desired PTP Clock Type and Delay Mechanism

h) Enter the number of Max Slaves Supported (maximum number of Dynamic Slaves + maximum number of Static Slaves) and Max Static Slaves Supported

i) Select/enter the remaining PTP options

j) Select **OK**

Step 29 Expand the Boundary Clock entity in the selection tree.

The Master Clock Interface entity is present

Step 30 Select the Master Clock Interface entity to verify entry details.

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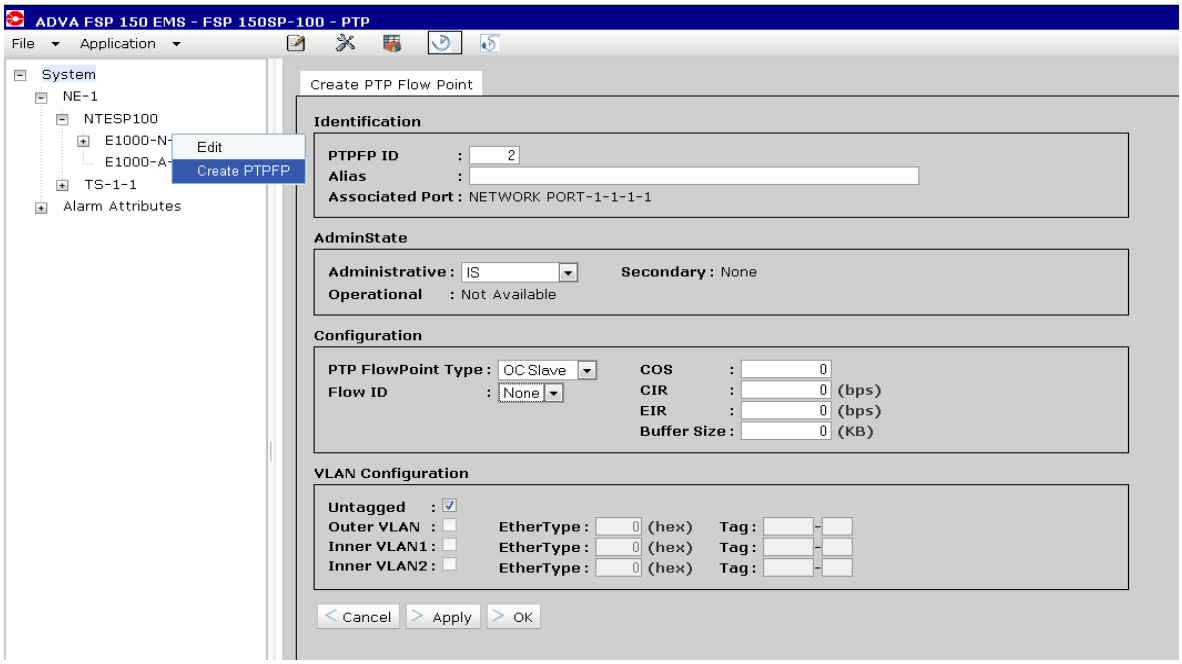
Step 31 Expand the NTESP100 entity. Enter a right click on the Network or Access Port associated with the PTP Flowpoint for the Master Clock Interface and select **Create PTPFP**.

A Create PTP Flow Point screen displays

Figure 115: Create PTP Flow Point



Step 32 Enter the following PTP Flow Point options:

a) Enter the desired PTPFP ID and Alias

b) Select the desired Administrative State

c) Set the PTP Flow Point Type to OC Master

d) Flow ID is fixed to None

e) Enter the desired COS, CIR, EIR and Buffer Size.

f) Deselect the Untagged frame check box if Inner and/or Outer VLAN tags need to be entered. Select the desired Inner/Outer VLAN tag check box(es) to allow tag entry, then enter the desired EtherType and VLAN Tag(s)

g) Select **OK**.

A PTP FLOW PT entity appears below the associated Ethernet Port entity in the selection tree pane

Step 33 Select the PTP FLOW PT entity and Configuration tab to view configuration details.

Step 34 Enter a right click on the Master Clock Interface entity and select **Create Master Virtual Port**.

A Create Master Virtual Port entry screen displays

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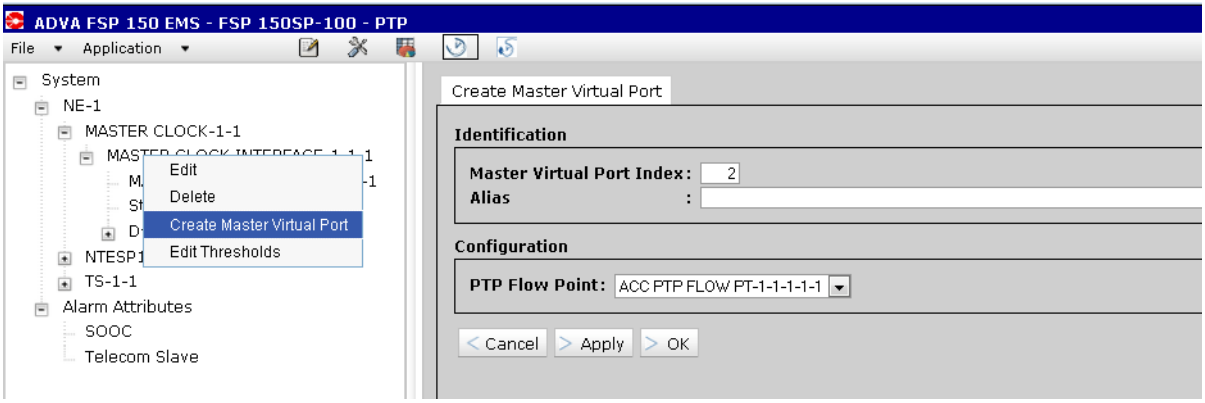
Figure 116: Create Master Virtual Port



Step 35 Enter the following Master Virtual Port options:

a) Enter the desired Master Virtual Port Index and Alias

b) Select the desired PTP Flow Point

c) Select **OK**

A Master Virtual Port entity appears below the associated Master Clock Interface entity in the selection tree pane

Step 36 Select the Master Virtual Port entity to view configuration details.

Step 37 If the Remote Slave unit has already been provisioned with Unicast Message Negotiation Enabled (Dynamic Slave) and the Master Clock Interface entity has been provisioned with the correct number of Maximum Slaves Supported to accept the Dynamic Slave unit, then the Dynamic Slave entity should be present. (Go to Step 71 to verify the Dynamic Slave connectivity and for reference steps to provision the Remote Slave unit as a Dynamic Slave.)

If the Remote Slave unit is/will be provisioned as a Remote Static Slave, go to Step 64.

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Edit the Time Clock

Perform the following steps for editing the Time Clock.

Prior to creating a Master Clock, a Time Clock must first be provisioned and In Service.

The Time Clock is used to select an active time reference out of two configured time references (Telecom Slave, SYNC or GPS) which may also be used to feed the physical output interfaces (TOD Out, PPS Out) and/or the Master Clock.

Note To provision a Telecom Slave, perform Step 2 through Step 18.

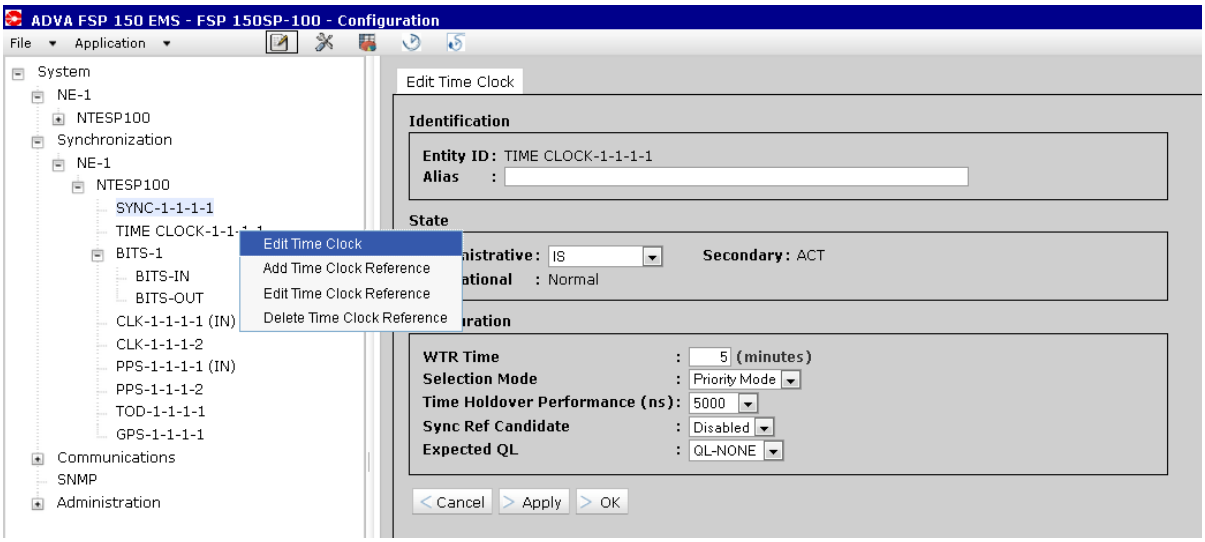
A second priority reference in addition to the first priority reference may be provisioned as a backup in case the first priority reference is lost.

Step 38 Select the Configuration Application on the tool bar or select Configuration from the Application Menu. Expand the System, Synchronization, NE-1 and NTESP100 entities in the selection tree pane by clicking on the “+” signs next to each entity to expand each view.

Step 39 Enter a right click on the Time Clock entity and select **Edit Time Clock**.

An Edit Time Clock window appears

Figure 117: Edit Time Clock



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Step 40 Enter the following Time Clock options:

a) Enter the desired Alias

b) Set the Administrative state to IS

c) Enter the desired Wait to Restore Time

d) Select the desired Selection Mode, Time Holdover Performance, Sync Reference Candidate and Expected QL options

e) Select **OK**

Step 41 Select the Time Clock entity and select the Configuration tab to verify configuration entry.Time Clock

Step 42 Continue with next step to add a Time Clock reference. Otherwise, go to Step 1.

Add Time Clock Reference

Perform the following steps for adding time clock reference(s) to the Time Clock.

Note

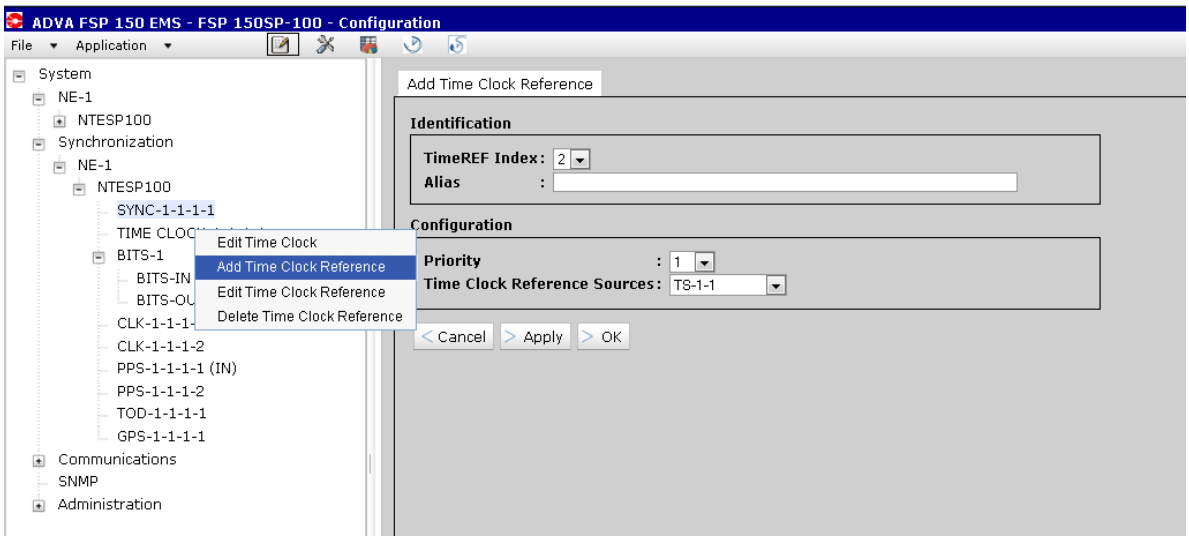
A second priority reference in addition to the first priority reference may be provisioned as a backup in case the first priority reference is lost.

Step 43 Select the Configuration Application on the tool bar or select Configuration from the Application Menu. Expand the System, Synchronization, NE-1 and NTESP100 entities in the selection tree pane by clicking on the “+” signs next to each entity to expand each view.

Step 44 Enter a right click on the Time Clock entity and select **Add Time Clock Reference**.

An Add Time Clock Reference window appears

Figure 118: Add a Time Clock Reference



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Step 45 Enter the following Time Clock Reference options:

a) Select the desired TimeREF Index number and enter the desired Alias

b) Select the desired Priority of this Time Clock Reference

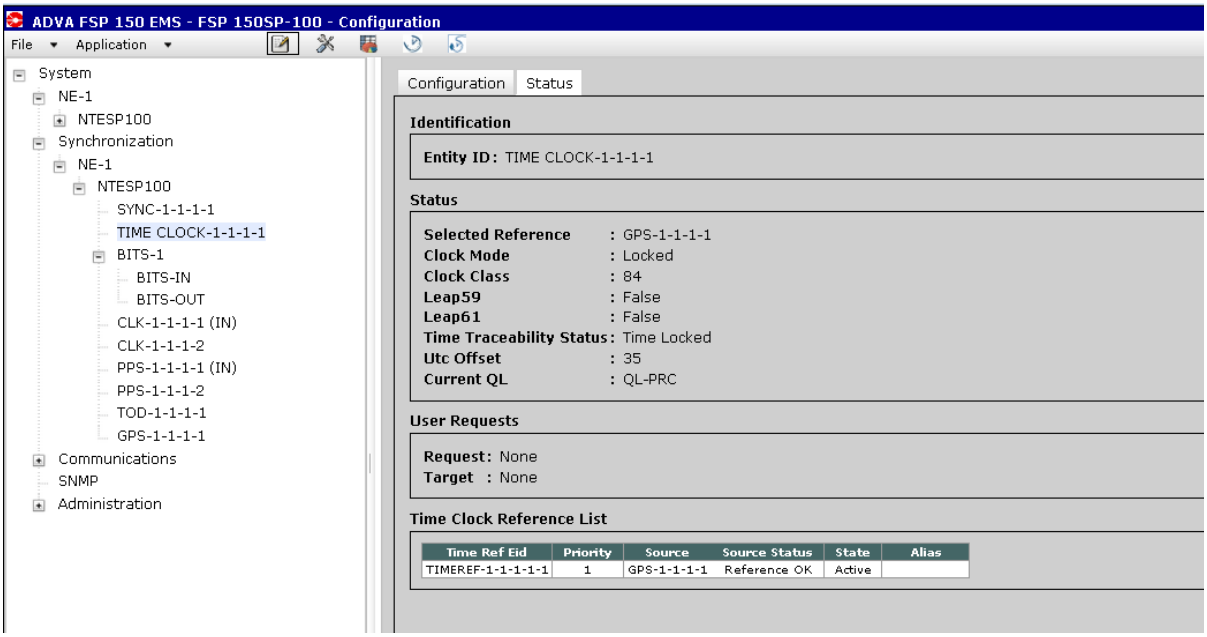
c) Select the desired Time Clock Reference Source

d) Select **OK**

Step 46 Add a second Time Clock Reference, if required, by repeating Step 44 and Step 45.

Step 47 Select the Time Clock entity and select the Status tab to verify reference configuration and status.

Figure 119: Time Clock Status



Step 48 Go to Step 1.

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Create a Master Clock

Perform the following steps for creating a Master Clock.

Note

Prior to creating a Master Clock, the PTP-MC/BC feature must be enabled and the Time Clock must first be provisioned (Step 38 through Step 47). A second priority reference in addition to the first priority reference may be provisioned as a backup in case the first priority reference is lost (see “Edit GPS” on p. 195).

Note

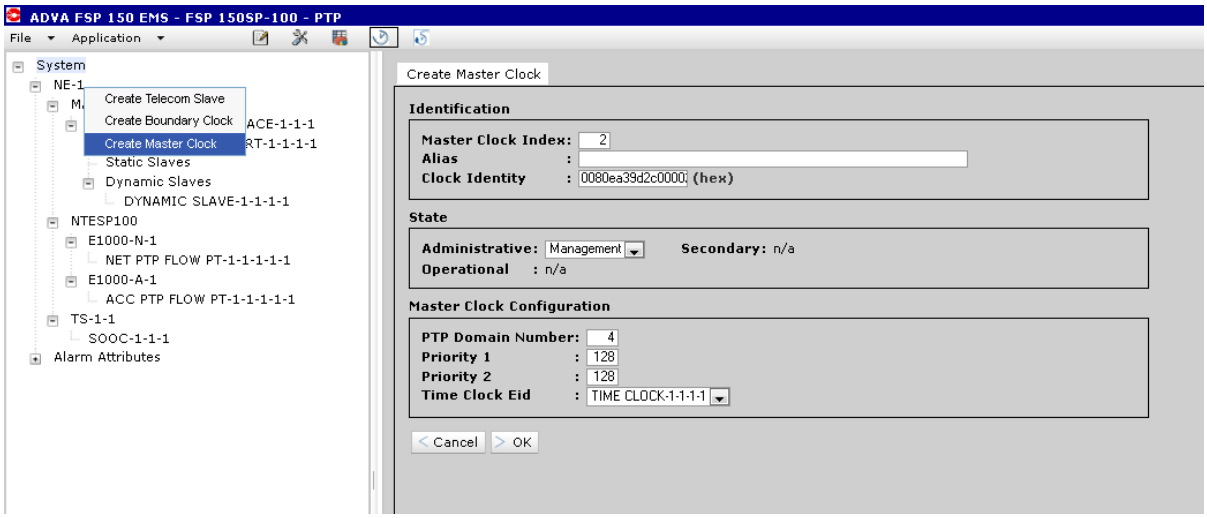
A Boundary Clock and Master Clock cannot co-exist. Only one or the other may be provisioned and In Service at a time. It is recommended that the time clock is locked before creating the master clock.

Step 49 Select the PTP Application on the tool bar or select PTP from the Application Menu. Expand the System and NE-1 entities in the selection tree pane, by clicking on the “+” signs next to each entity to expand each view.

Step 50 Enter a right click on the NE-1 entity and select **Create Master Clock**.

A Create Master Clock window displays

Figure 120: Create Master Clock



Step 51 Enter the following Master Clock options:

a) Enter the desired Alias and Master Clock Index

b) Enter the Clock Identity

c) Set the Administrative state to IS

d) Enter the PTP Domain Number, Priority 1 and Priority 2 (based on IEEE 1588v2).

e) Select the Time Clock EID

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f) Select **OK**

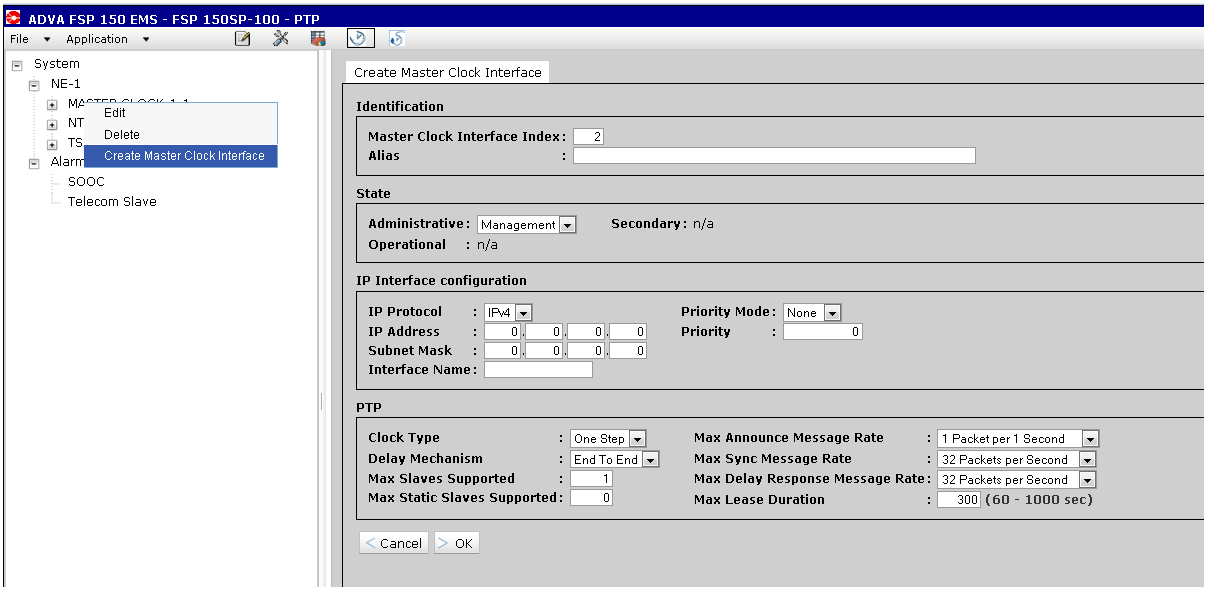
The Master Clock entity displays below the network element entity in the Selection Tree

Step 52 Select the Master Clock entity to verify entry details.

Step 53 Enter a right click on the Master Clock entity and select **Create Master Clock Interface**.

A Create Master Clock Interface window displays

Figure 121: Create Master Clock Interface (for Master Clock)



Step 54 Enter the following Master Clock Interface options:

a) Enter the desired Alias and Master Clock Interface Index

b) Set the Administrative state to IS

c) Select the desired IP Protocol

d) Enter the appropriate IP Address and Subnet Mask

e) Enter the Interface Name (mandatory)

f) Select/enter the desired Priority Mode and Priority

g) Select the desired PTP Clock Type and Delay Mechanism

h) Enter the number of Max Slaves Supported (maximum number of Dynamic Slaves + maximum number of Static Slaves) and Max Static Slaves Supported

i) Select/enter the remaining PTP options

j) Select **OK**

Step 55 Expand the Master Clock entity in the selection tree.

The Master Clock Interface entity is present

Step 56 Select the Master Clock Interface entity to verify entry details.

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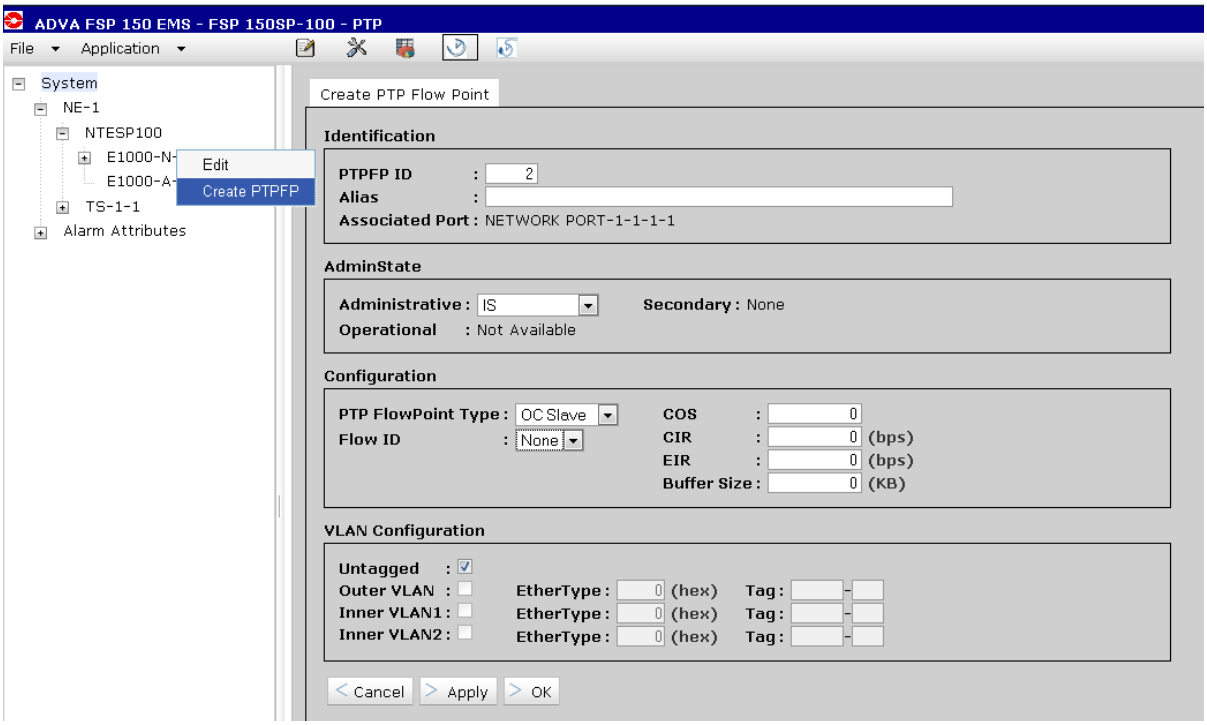
Step 57 Enter a right click on the Network or Access Port associated with the PTP Flowpoint for the Master Clock Interface source and select **Create PTPFP**.

A Create PTP Flow Point screen displays

Figure 122: Create PTP Flow Point



Step 58 Enter the following PTP Flow Point options:

a) Enter the desired PTPFP ID and Alias

b) Select the desired Administrative State

c) Set the PTP Flow Point Type to OC Master and select the desired Flow ID, if required

d) Enter the desired COS, CIR, EIR and Buffer Size.

e) Deselect the Untagged frame check box if Inner and/or Outer VLAN tags need to be entered. Select the desired Inner/Outer VLAN tag check box(es) to allow tag entry, then enter the desired EtherType and VLAN Tag(s)

f) Select **OK**.

A PTP FLOW PT entity appears below the associated Ethernet Port entity in the selection tree pane

Step 59 Select the PTP FLOW PT entity and Configuration tab to view configuration details.

Step 60 Enter a right click on the Master Clock Interface entity and select **Create Master Virtual Port**.

A Create Master Virtual Port entry screen displays

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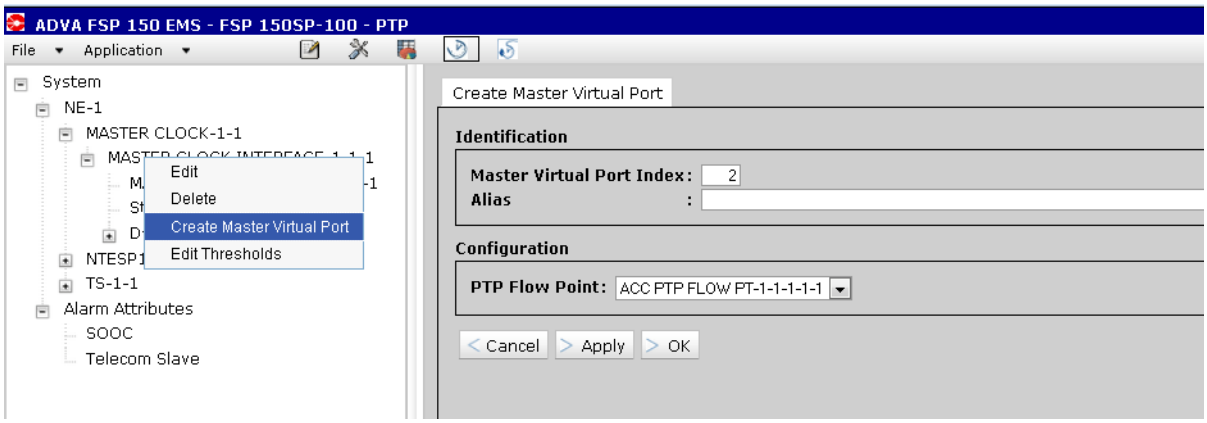
Figure 123: Create Master Virtual Port



Step 61 Enter the following Master Virtual Port options:

a) Enter the desired Master Virtual Port Index and Alias

b) Select the desired PTP Flow Point

c) Select **OK**

A Master Virtual Port entity appears below the associated Master Clock Interface entity in the selection tree pane

Step 62 Select the Master Virtual Port entity to view configuration details.

Step 63 If the Remote Slave has already been provisioned as a Dynamic Slave and the Master Clock entity has been provisioned with the correct number of Master Slaves Supported to accept the Dynamic Slave, then the Dynamic Slave entity should be present. Go to Step 71 to verify the Dynamic Slave connection and for reference steps to provision the Remote Slave unit as a Dynamic Slave.

If the Remote Slave is/will be provisioned as a Remote Static Slave, go to Step 64.

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Create a Static Remote Slave

The following procedure is performed at the Boundary Clock / Master Clock site for this remote slave.

Note

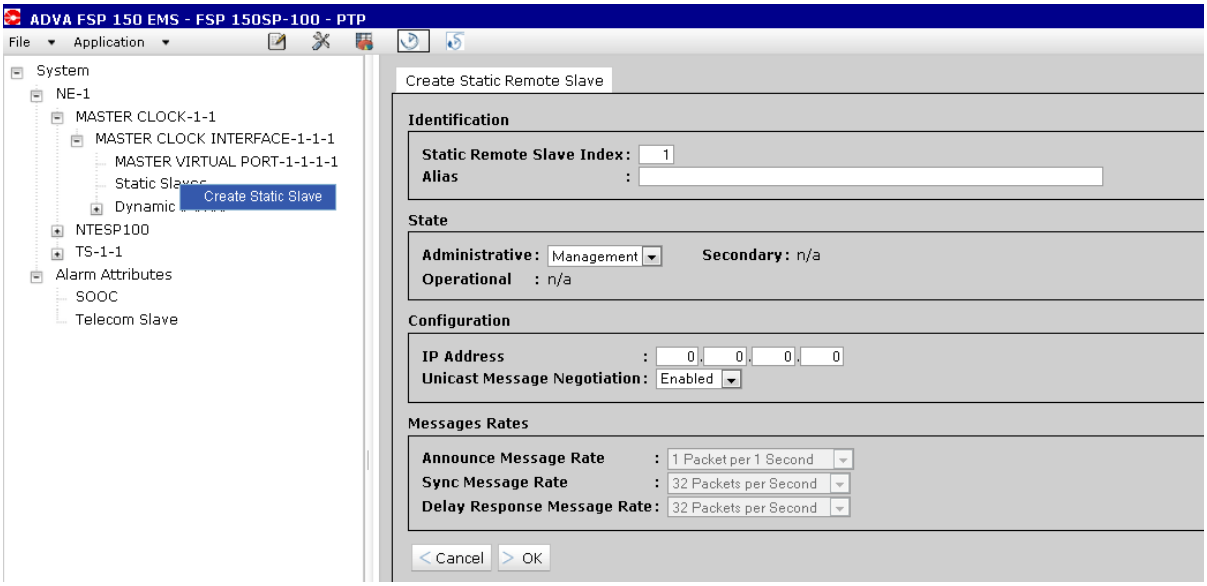
Prior to creating a Static Remote Slave, the Remote Slave should be connected and provisioned.

If the Remote Slave is an FSP150 unit, it must already have a Telecom Slave provisioned (see Step 2 through Step 18).

Step 64 Enter a right click on the Static Slaves entity in the Selection tree and select Create Static Slave.

A Create Static Remote Slave window is displayed

Figure 124: Create Static Remote Slave



Step 65 Enter the following Static Remote Slave options:

a) Enter the desired Static Remote Slave Index and Alias

b) Set the Administrative state to IS

c) Enter the IP address of the Static Remote Slave and enable or disable Unicast Message Negotiation. If set to Disabled, then select the desired message rates for each type (announce, sync, delay response).

d) Select **OK**

A Static Slave entity appears below the associated Static Slaves entity in the selection tree pane

Step 66 Select the Static Slave entity and select the Configuration tab to view configuration details and status. If the remote node is provisioned and connected correctly, Status results are displayed.

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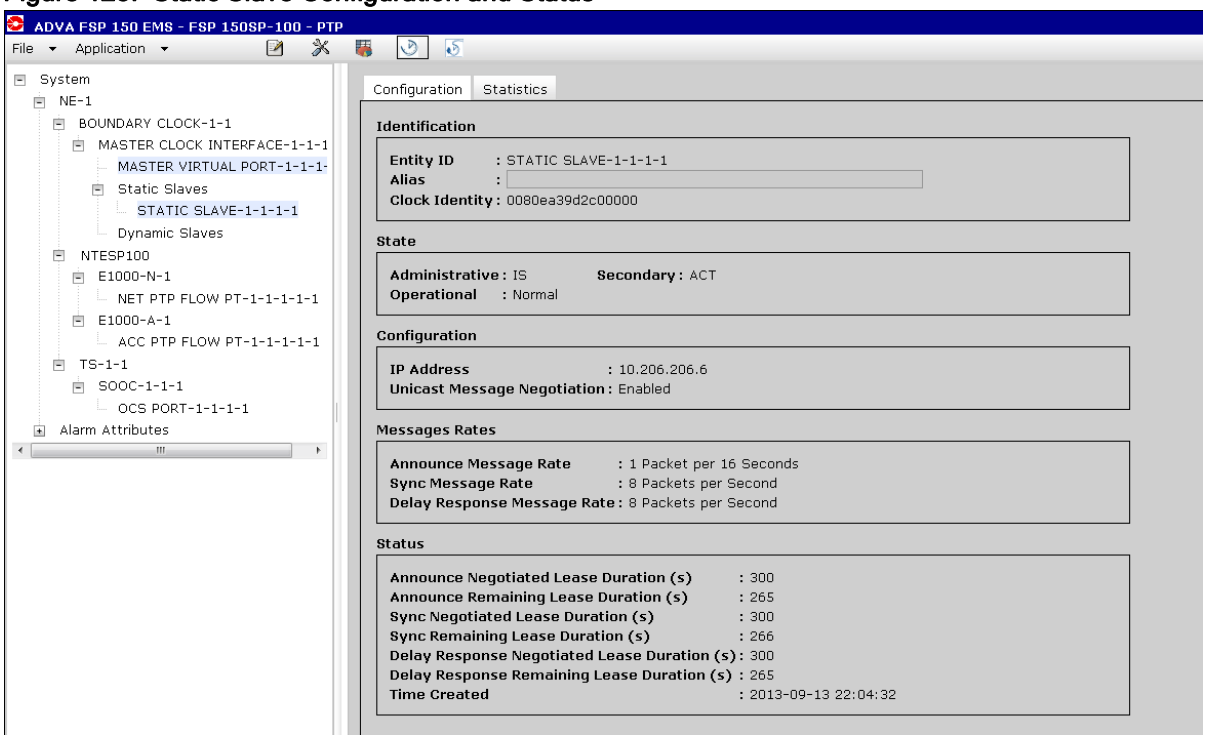
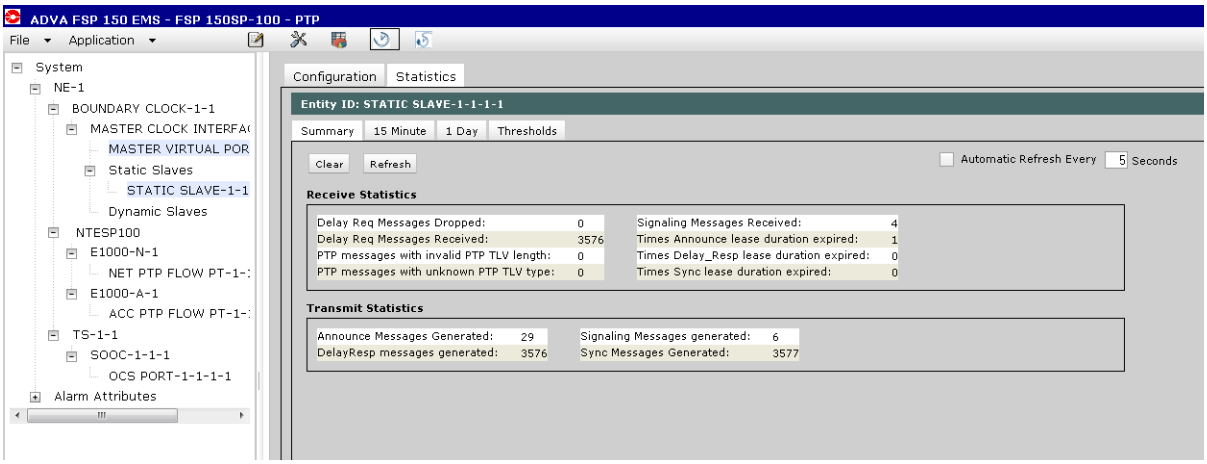
Figure 125: Static Slave Configuration and Status



Step 67 Select the Static Slave Statistics tab to view Received and Transmit statistics.

Figure 126: Static Slave Statistics



Step 68 If statistics are not indicating message receive and transmit statistics as expected, troubleshoot accordingly.

Step 69 At the FSP150 remote node, select the OCS PORT entity to view configuration details and Port State. Wait until the Port Status changes to Slave (Locked).

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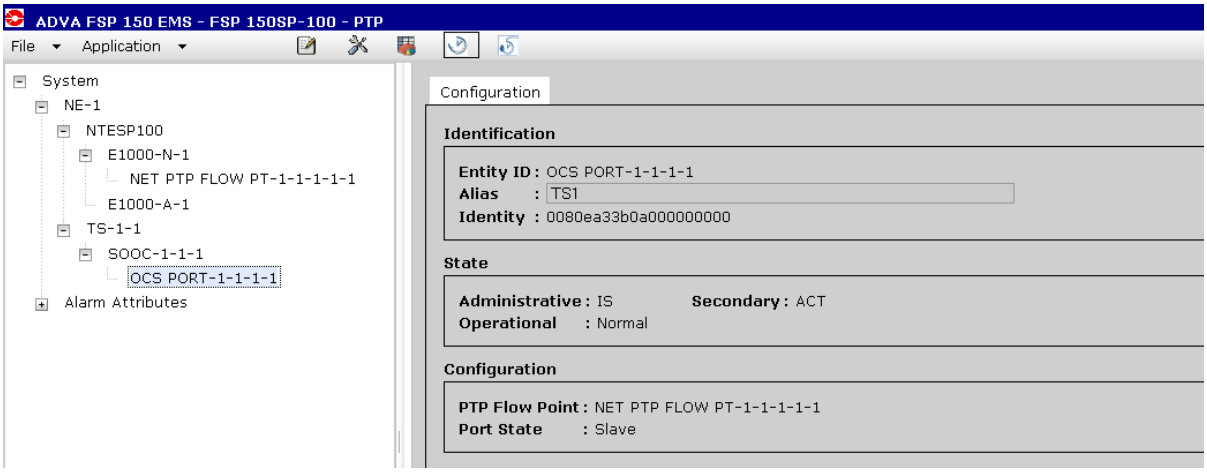
Figure 127: Slave OCS Port State



Step 70 Go to Step 1.

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Verify a Dynamic Remote Slave Connectivity

The following procedure is performed at the node that is provisioned for Boundary Clock / Master Clock.

Note

Ensure connectivity to the Remote Slave and it is provisioned with Unicast Message Negotiation Enabled.

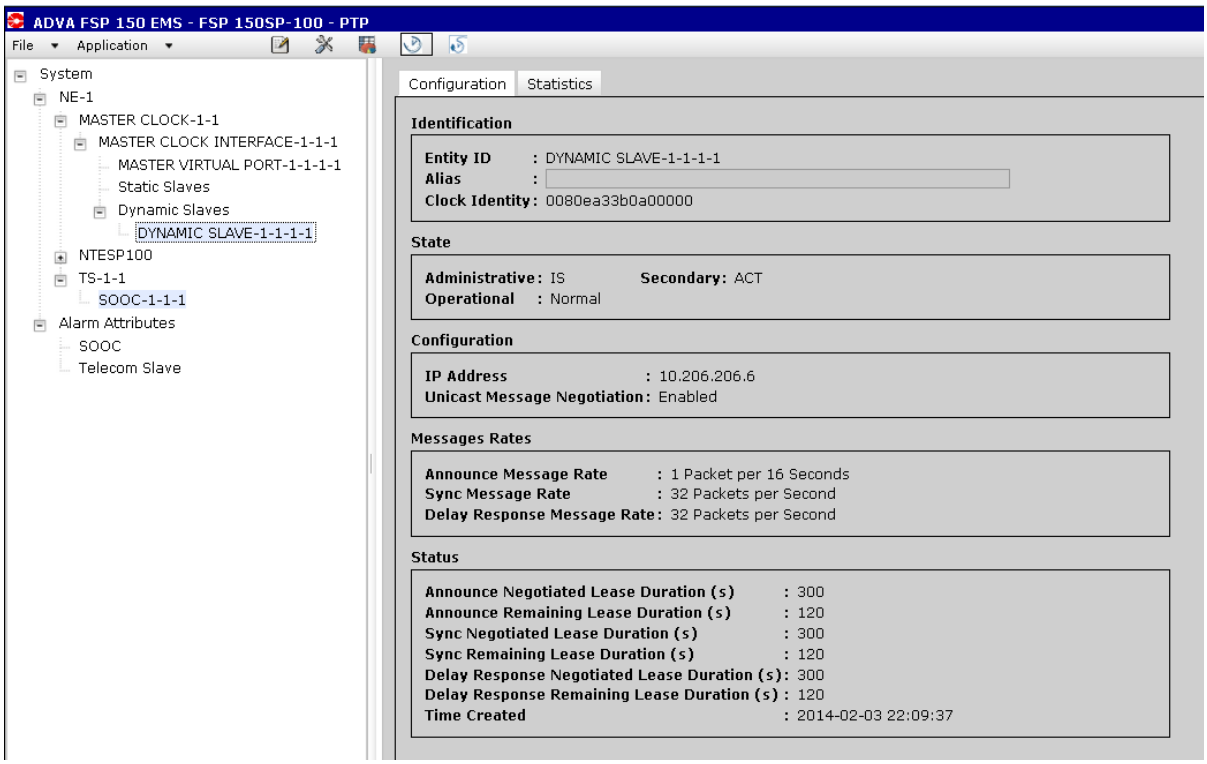
If the Remote Slave is an FSP150 unit, it must already have a Telecom Slave provisioned (see Step 2 through Step 18).

Step 71 Expand the Dynamic Slaves entity in the selection tree pane.

The Dynamic Remote Slave entity is present

Step 72 Select the Dynamic Slave entity and select the Configuration tab to view configuration details and status. If the remote node is provisioned and connected correctly, the Dynamic Remote Slave entity is present and Status results are displayed.

Figure 128: Verify Dynamic Remote Slave



Step 73 Select the Dynamic Slave Statistics tab to view Receive and Transmit statistics.

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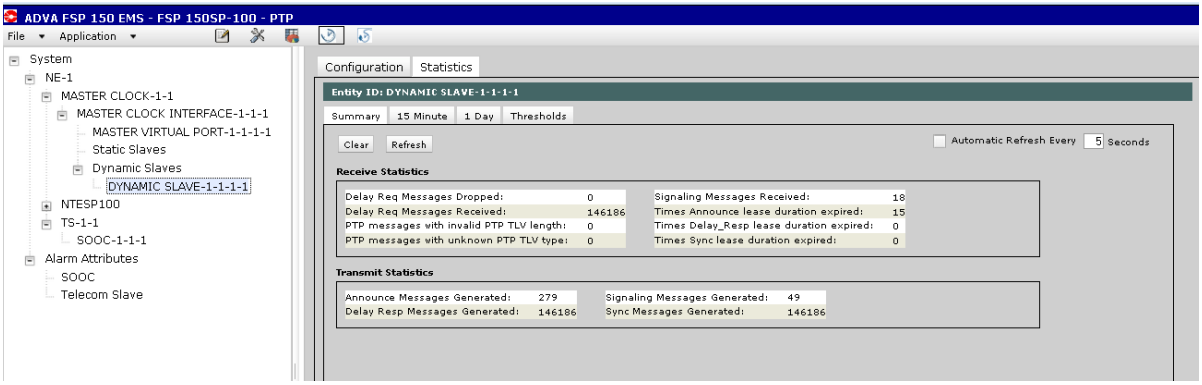
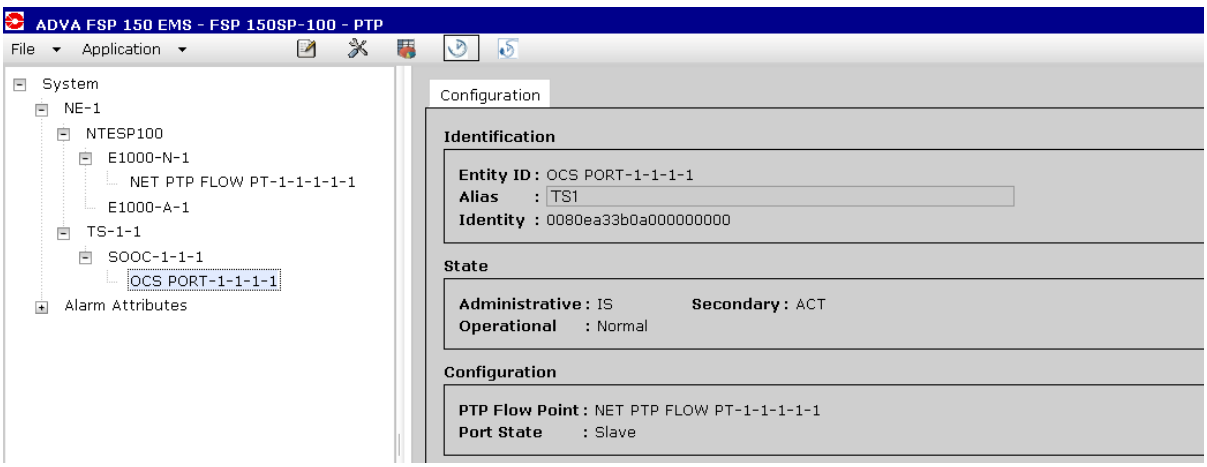
Figure 129: Dynamic Slave Statistics



Step 74 If the Dynamic Slave entity is not present or statistics are not indicating message receive and transmit statistics as expected, troubleshoot accordingly.

Step 75 At the FSP 150 remote node, select the OCS PORT entity to view configuration details and Port State. Wait until the Port Status changes to Slave (Locked).

Figure 130: Slave OCS Port State



Step 76 Go to Step 1.

End of Procedure

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Provision SyncJack

See “SyncJack Testing” on p. 344.

Provision Performance Monitoring

See “Network/Access Port Performance Monitoring” on p. 321.

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Database and Configuration Files

There are two different ways to manage database files on the FSP 150SP:

- ICF Configuration Files (binary) via eVision, SNMP and CLI
- CLI Configuration Files (text based) via CLI and eVision

These two types of files can be used in a complimentary fashion, or they can be used independently. Each type of file and its use is described under the headings ICF Configuration Files and CLI Configuration Files.

There is a third type of Database File supported by the FSP 150SP called the Default Settings File. This is an XML based file that changes the default settings applied when a new entity (such as an EVPL Flow) is created. This file is downloaded and applied to the unit if the factory default values are determined to be not applicable or unacceptable to the user's application. See Default Settings Value File, on Page 4-266.

Note

If using Internet Explorer 8, in order to view certain eVision elements correctly (namely data provided in Maintenance View - e.g., Restore factory defaults, Restore system defaults, Restore database, New System Defaults File), enable Compatibility View in IE by selecting Tools, Compatibility View Settings and adding the FSP 150SP IP address to the list of websites data field.

ICF Configuration Files

The ICF (Implementation Configuration File) database files are binary copies of the complete database and are not user editable. While the binary database files can be managed using CLI or SNMP commands, the FSP 150SP provides an easy means to manage the binary database files using the following configuration database management functions via the eVision Web Browser:

- Create a Database Backup
- Restore Database
- Setting a Default Database
- Restore System Defaults
- Restore Factory Defaults

Determining Database Configuration Status

When the database of the FSP 150SP is modified, it stores the changes in non-volatile memory. If a power loss / system reboot occurs, all configuration data is retained. There are three versions of the database always resident on the system, plus a "standby" copy of the current database. The three versions are the current running configuration, a System Default that may be modified and saved by a user, and a Factory Default that may not be modified. When first commissioned, these three database copies are identical.

As provisioning occurs, the current running configuration database is updated with each change entered. At some point, the user may determine that the cur-

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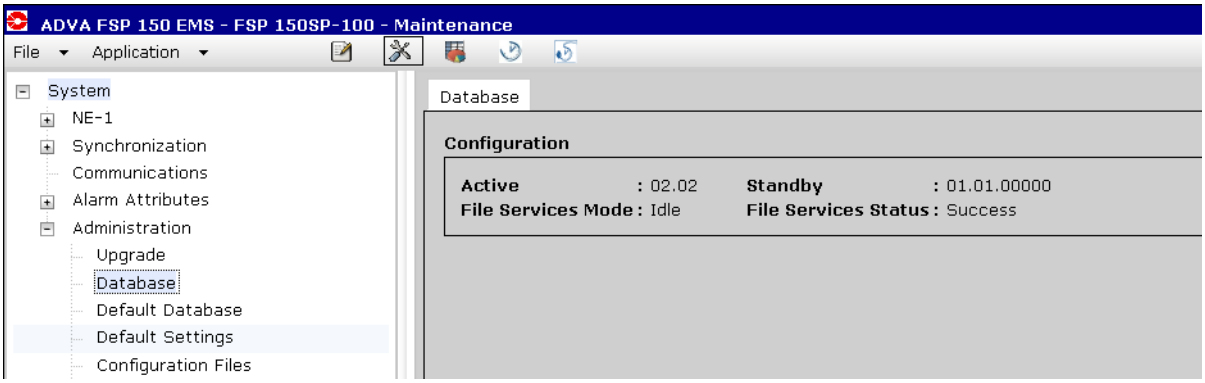
rent copy should be the default database for this unit, at which time the user should perform the Setting a Default Database procedure. Then, if required the database can be restored to these settings by performing the Restore System Defaults procedure.

The Factory Default Database never changes, and as a last resort troubleshooting tool, or upon decommissioning, the current database can be reset to factory defaults by performing the Restore Factory Defaults procedure.

The Default Database can also be reset to Factory Defaults using the “New” option in the Setting a Default Database procedure. The difference is, when using the “New” option selection, any user uploaded “Default Settings” will be erased.

To view the configuration database information in eVision, select Maintenance view, expand the **Administration** entity, and then select the **Database** entity (see Figure 131 on p. 237 for an example of a default database configuration). The display shows the current database version for both the active and standby partitions as well as the status.

Figure 131: Database Status Display



Setting a Default Database

At the original commissioning of the unit, the Default Database and the Factory Default Database are identical. At some point, it may be desirable to reset the current database to something other than the Factory Defaults, especially if a specific and complex management communications and/or remote access configuration has been provisioned.

The FSP 150SP permits the user to designate the current configuration as the Default Database or to reset the Default Database to factory defaults using this procedure.

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The following procedure includes steps for setting a Default Database using the eVision tool. It is also possible to perform this process using CLI. See the *FSP 150SP-100 Command Line Reference Guide* for details. The following procedure also assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see "Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port" on p. 276) and is logged on using eVision.

Procedure

Step 1 Click on the Maintenance icon, or select "Maintenance" from the application drop-down list.

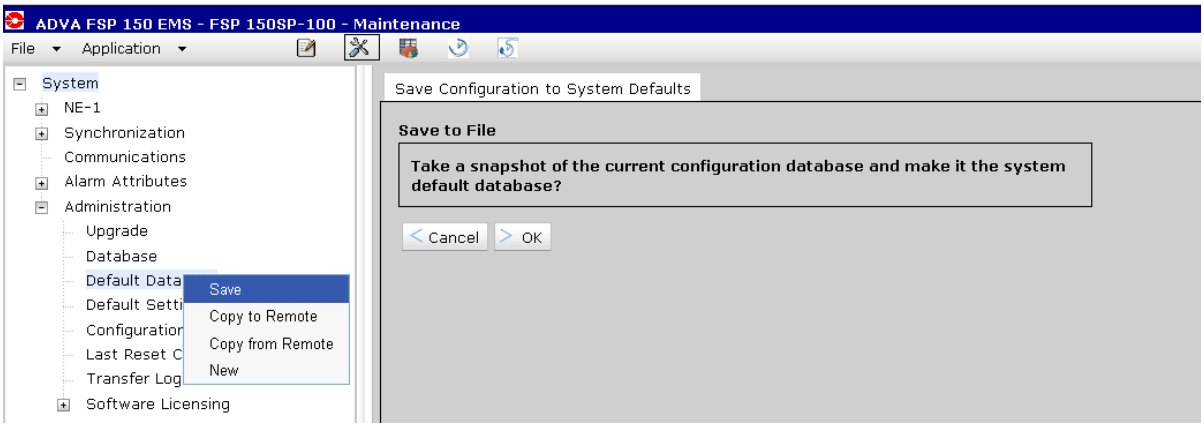
Step 2 Determine the next step.

Desired Activity	Then
Set the current database as the Default Database?	Continue with the next step.
Copy the System Default Database to a remote site?	Go to Step 5.
Copy a Default Database from a remote site?	Go to Step 10.
Reset the Default Database to Factory Defaults?	Go to Step 15.

Step 3 Expand "Administration", right click on "Default Database" and select **Save**.

The display is the Save Configuration to System Defaults view, shown in the figure below.

Figure 132: Save Configuration to System Defaults View



Step 4 Click **OK**.

End of Procedure

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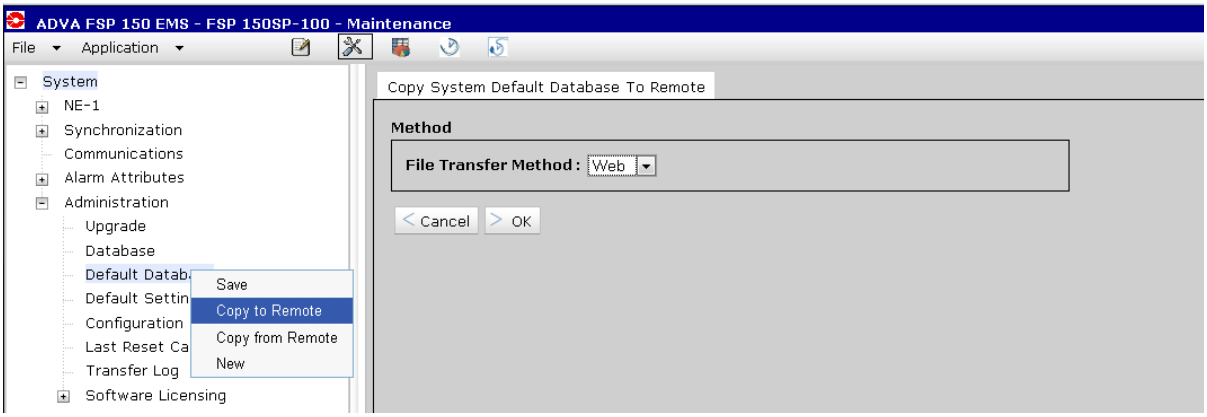
Step 5 Expand “Administration”, right click on “Default Database” and select **Copy To Remote**.

The display is the Copy To Remote, File Transmit Method view, shown in the following figure.

Figure 133: Copy System Default Database To Remote - Web View



Step 6 Determine the next step.

Desired File Transfer Method	Then
Web (HTTP)?	Continue with the next step.
FTP, SFTP or SCP?	Go to Step 8.

Step 7 Click on **OK**, then click on the underlined “**here**” for HTTP File Transfer.

You are prompted to open or save the file. Select the save option to save the file.

The options presented for file saving are dependent on the browser being used and the options the user has selected for browser operation. For example, MS Internet Explorer will prompt for file name and where the file should be saved, Firefox will save the file with the default file name (backupdb.bin) to the user’s download folder.

Note

A browser with File Download Prompting enabled and pop-up blocking enabled may not allow a transferred file to be successfully downloaded to the system. With this configuration, the system logs may indicate successful file download, when the browser has not properly saved the file. The file may be successfully downloaded and saved by either disabling configuration of File Download Prompting or disabling pop-up blocking; or using the browser’s pop-up override capability to allow the file save to complete.

End of Procedure

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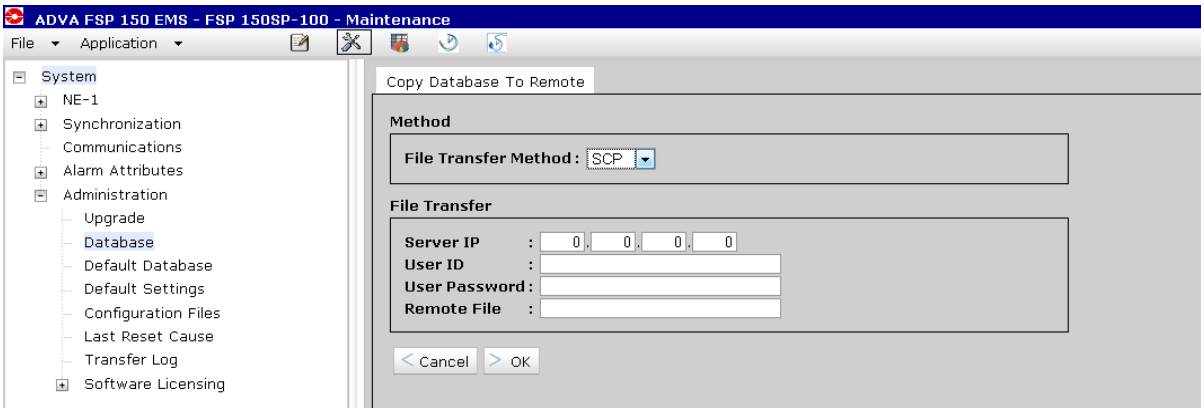
Step 8 For “File Transfer Method” select **FTP**, **SFTP** or **SCP** from the drop-down list.

The display changes to the FTP, SFTP or SCP file transfer view, shown in the following figure. (The figure shows the SCP view, the FTP and SFTP views are identical.)

Figure 134: Copy Database To Remote - SCP View



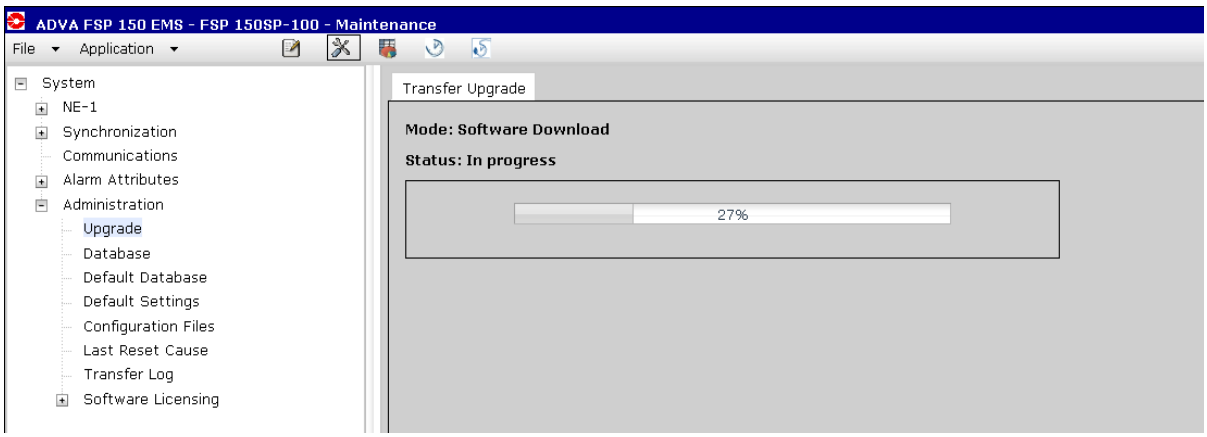
Step 9 Enter the data required in the screen to access the FTP, SFTP or SCP server and begin the file transfer process, and click on **OK**.

Note

It is assumed that the user knows the IP address of the FTP, SFTP or SCP server, has a valid user ID and password and knows the path and file name of the software file to transfer.

The file transfer will begin, and show a screen similar to the following displays.

Figure 135: Transfer Progress Screen



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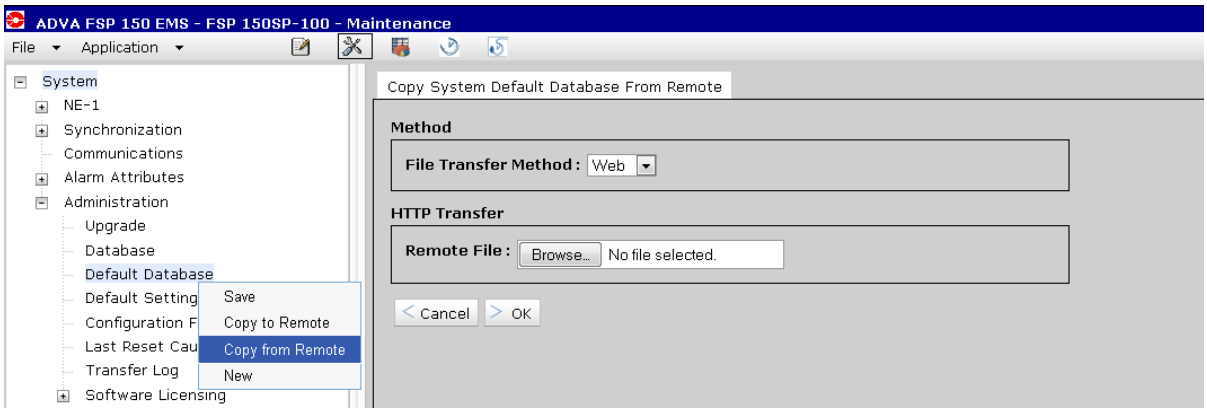
When the “Status” changes from “Progress” to “Success”, the file has been transferred.

End of Procedure

Step 10 Expand “Administration”, right click on “Database” and select **Copy from Remote**.

The display is the Copy From Remote view, shown in the following figure:

Figure 136: Copy Database From Remote - Web View



Step 11 Determine the next step.

Desired File Transfer Method	Then
Web (HTTP)?	Continue with the next step.
FTP, SFTP or SCP?	Go to Step 13.

Step 12 Enter the path to the file to restore, or browse to the file location, then click on **OK**.

The file will be copied from the source location and the Detail Pane will indicate when the file transfer is 100% complete.

End of Procedure

Step 13 For “File Transfer Method” select **FTP**, **SFTP** or **SCP** from the drop-down list.

The display changes to the FTP, SFTP or SCP file transfer view, shown in the following figure: (The figure shows the SCP view, the FTP and SFTP views are identical.)

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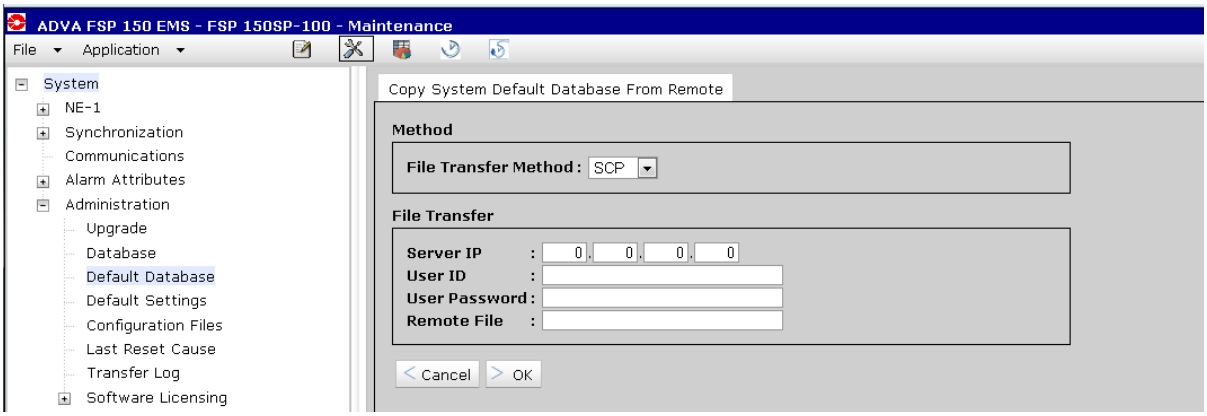
Figure 137: Copy Database From Remote - SCP View



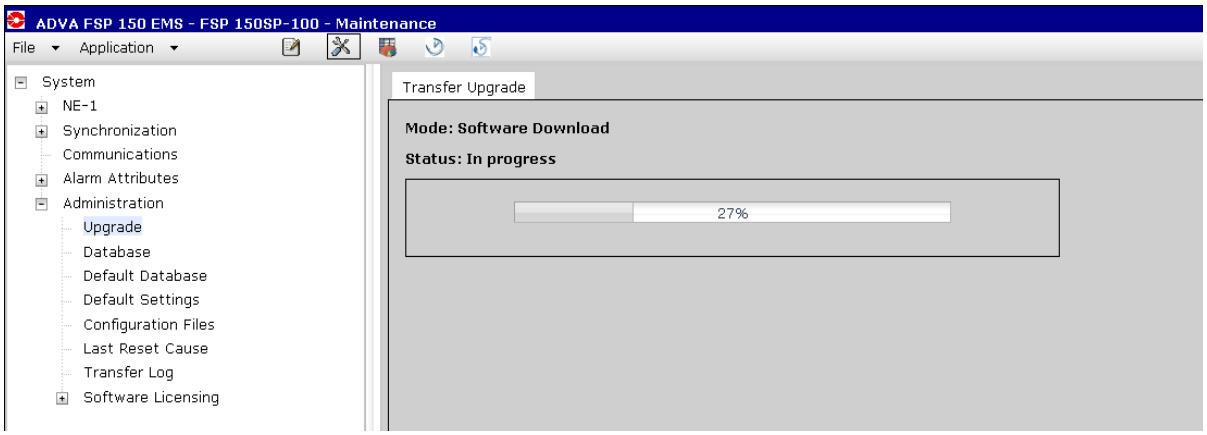
Step 14 Enter the data required in the screen to access the FTP, SFTP or SCP server and begin the file transfer process, and click on **OK**.

Note

It is assumed that the user knows the IP address of the FTP, SFTP or SCP server, has a valid user ID and password and knows the path and file name of the database file to transfer.

The file transfer will begin, and show a screen similar to the following:

Figure 138: File Transfer Progress Screen



The file will be copied from the source location and the Detail Pane will indicate when the file transfer is 100% complete.

End of Procedure

Step 15 Expand “Administration”, right click on “Default Database” and select **New**.

The display is the Save Configuration to System Defaults view, shown in the figure below.

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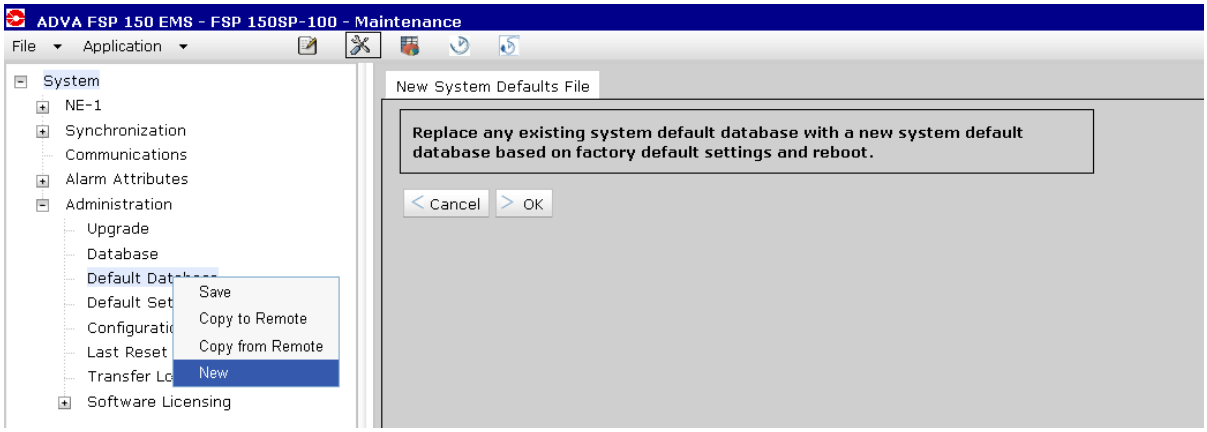
Figure 139: New System Defaults View



CAUTION Resetting the database to factory defaults will drop all traffic and erase all communications and user settings, including the loss of the eVision connection to the NE. When using the “New” option selection, any user uploaded “Default Settings” will be erased. This operation should not be performed lightly. It may be advisable to backup the current database so that it can be restored later.

Step 16 Click **OK**.

The System resets the Default Database and Active Database to Factory Defaults.

End of Procedure

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Create a Database Backup

Backing up the system database is a two step process:

- First, the database has to be transferred to a temporary location on the NE.
- Second, the database file is transferred to a remote repository. The NE supports transfer via HTTPS (Web), FTP, SFTP and SCP protocols.

The following procedure includes steps for performing the database backup process using the eVision tool. It is also possible to perform this process using CLI. See the *FSP 150SP-100 Command Line Reference Guide* for details. The following procedure also assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

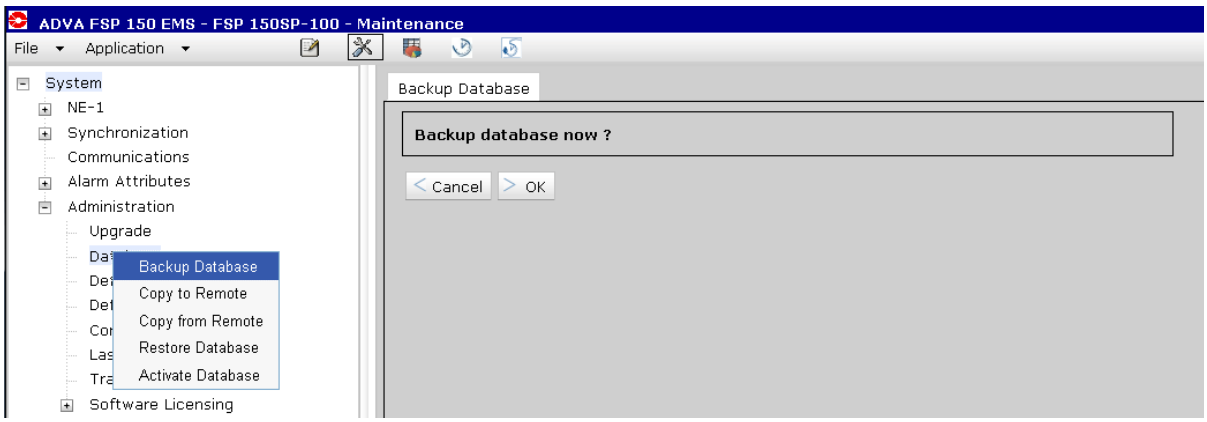
Procedure

Step 1 Click on the maintenance icon, or select “Maintenance” from the application drop-down list.

Step 2 Expand “Administration”, right click on “Database” and select **Backup Database**.

The display is the Backup Database view, shown in the figure below.

Figure 140: Backup Database View



Step 3 Click on **OK**, wait a few seconds, then click on “Database” in the selection tree pane and the Details Pane will show the results of the Back Up operation. See the following figure:

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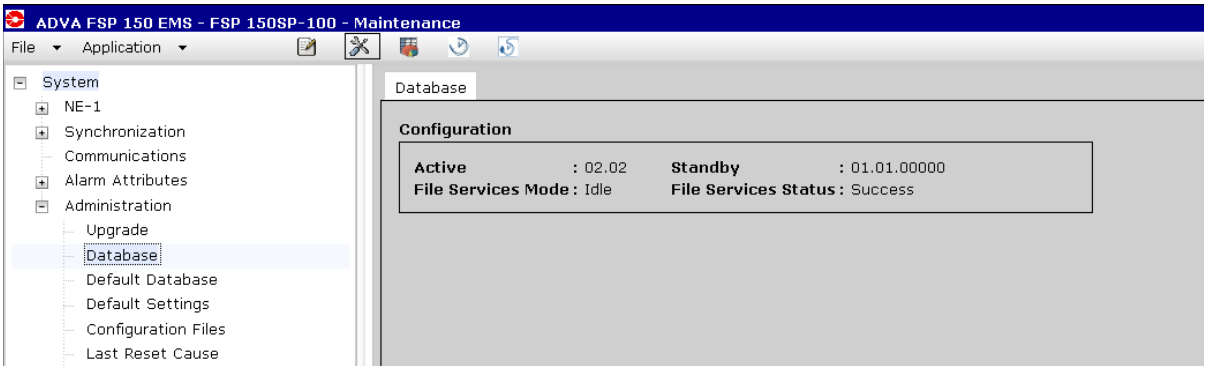
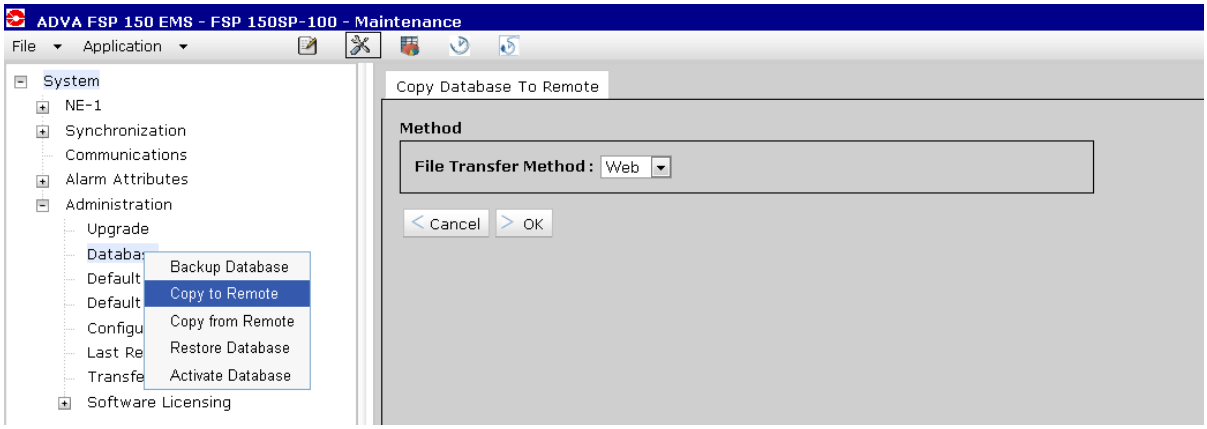
Figure 141: Database Back Up Status View



Step 4 Right click on “Database” and select **Copy to Remote**.

The display is the Copy to Remote, File Transmit Method view, shown in the figure below.

Figure 142: Copy Database To Remote - Web View



Step 5 Determine the next step.

Desired File Transfer Method	Then
Web (HTTP)?	Continue with the next step.
FTP, SFTP or SCP?	Go to Step 7.

Step 6 Click on **OK**, then click on the underlined “**here**” for HTTP File Transfer.

You are prompted to open or save the file. Select the save option to save the file.

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The options presented for file saving are dependant on the browser being used and the options the user has selected for browser operation. For example, MS Internet Explorer will prompt for file name and where the file should be saved, Firefox will save the file with the default file name (backupdb.bin) to the computer desktop.

Note

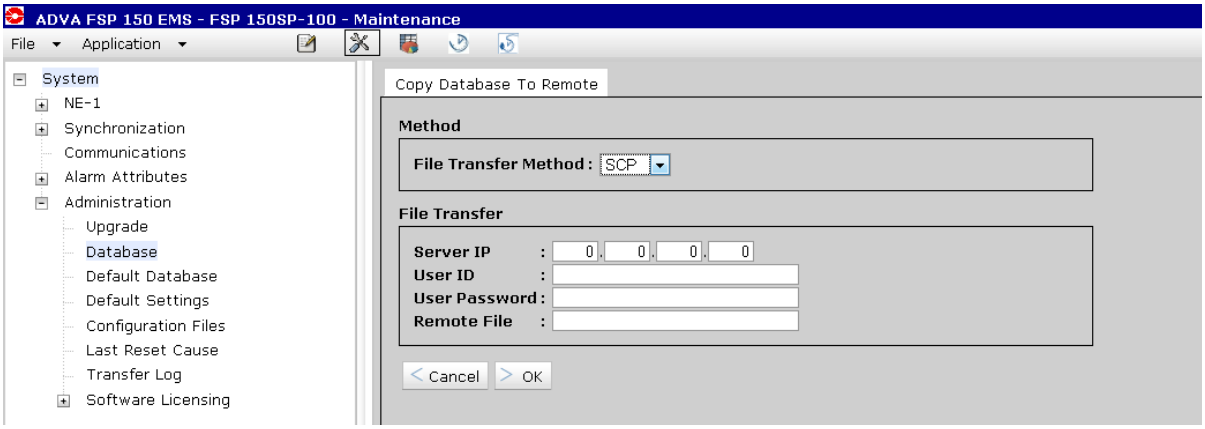
A browser with File Download Prompting enabled and pop-up blocking enabled may not allow a transferred file to be successfully downloaded to the system. With this configuration, the system logs may indicate successful file download, when the browser has not properly saved the file. The file may be successfully downloaded and saved by either disabling configuration of File Download Prompting or disabling pop-up blocking; or using the browser's pop-up override capability to allow the file save to complete.

End of Procedure

Step 7 For "File Transfer Method" select **FTP**, **SFTP** or **SCP** from the drop-down list.

The display changes to the FTP, SFTP or SCP file transfer view, shown in the figure below. (The figure shows the SCP view, the FTP and SFTP views are identical.)

Figure 143: Copy Database to Remote - SCP View



Step 8 Enter the data required in the screen to access the FTP, SFTP or SCP server and begin the file transfer process, and click on **OK**.

Note

It is assumed that the user knows the IP address of the FTP, SFTP or SCP server, has a valid user ID and password and knows the path and file name of the software file to transfer.

The file transfer will begin, and show a screen similar to the following displays.

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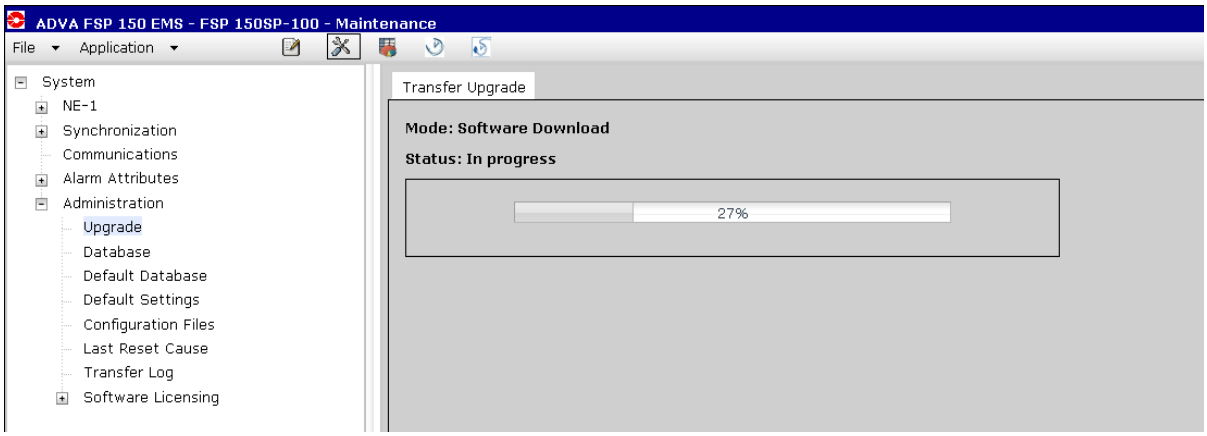
Figure 144: File Transfer Progress Screen



Step 9 When the “Status” changes from “Progress” to “Success”, the file has been transferred.

End of Procedure

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Restore Database

Restoring the database is a multi-step process:

- First, the database file has to be transferred from an external repository to a temporary location on the NE. The NE supports transfer via HTTP (Web), FTP, SFTP and SCP protocols.
- Second, the database file must be transferred to standby memory on the NE.
- Third, the database is activated, which causes the NE to reset and temporarily interrupt traffic and cancel active user sessions.

The following procedure includes steps for performing the database restore process using the eVision tool. It is also possible to perform this process using CLI. See the *FSP 150SP-100 Command Line Reference Guide* for details. The following procedure also assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see "Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port" on p. 276) and is logged on using eVision.

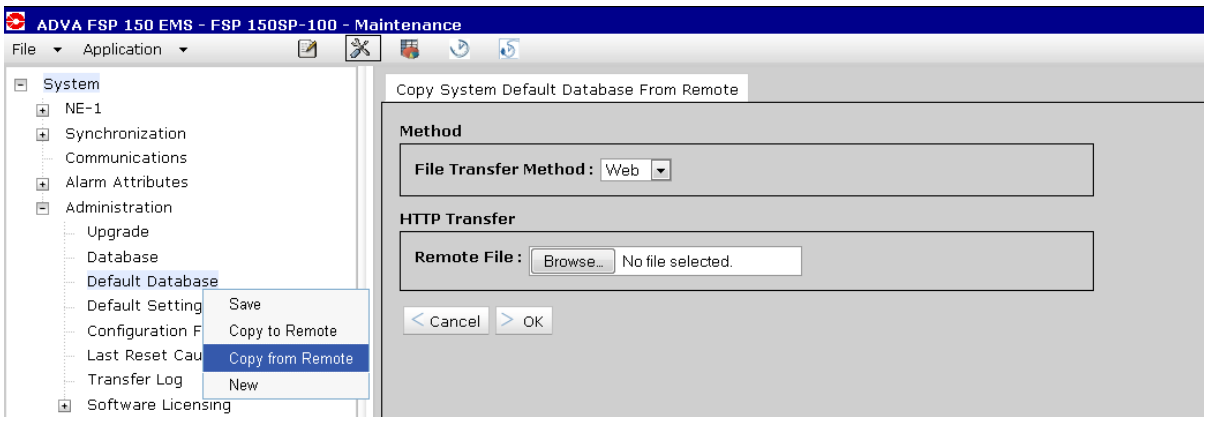
Procedure

Step 1 Click on the Maintenance icon, or select "Maintenance" from the application drop-down list.

Step 2 Expand "Administration", right click on "Database" and select **Copy from Remote**.

The display is the Copy From Remote view, shown in the following figure:

Figure 145: Copy Database From Remote - Web View



Step 3 Determine the next step.

Desired File Transfer Method	Then
Web (HTTP)?	Continue with the next step.
FTP, SFTP or SCP?	Go to Step 6.

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Step 4 Enter the path to the file to restore, or browse to the file location, then click on **OK**.

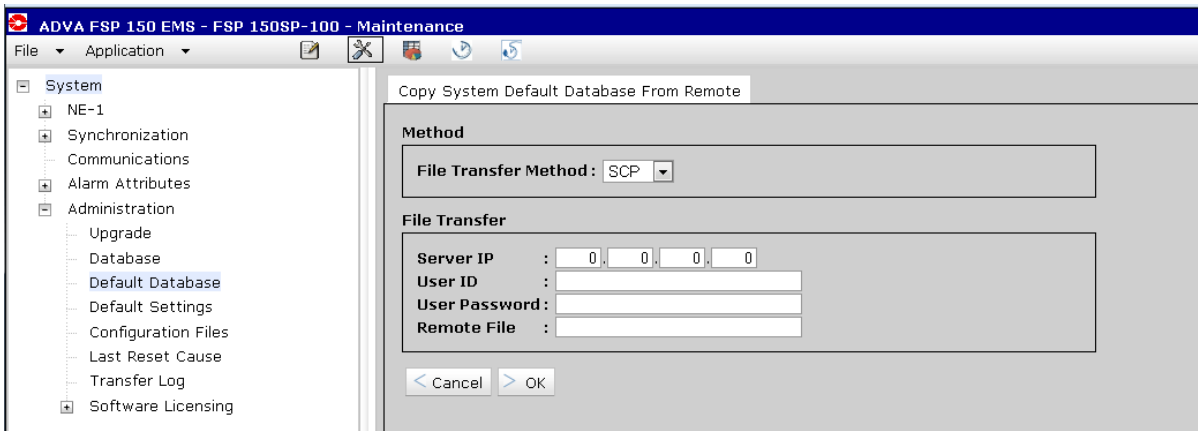
The file will be copied from the source location and the Detail Pane will indicate when the file transfer is 100% complete.

Step 5 Go to Step 8.

Step 6 For “File Transfer Method” select **FTP**, **SFTP** or **SCP** from the drop-down list.

The display changes to the FTP, SFTP or SCP file transfer view, shown in the following figure. (The figure shows the SCP view, the FTP and SFTP views are identical.)

Figure 146: Copy Database From Remote - SCP View



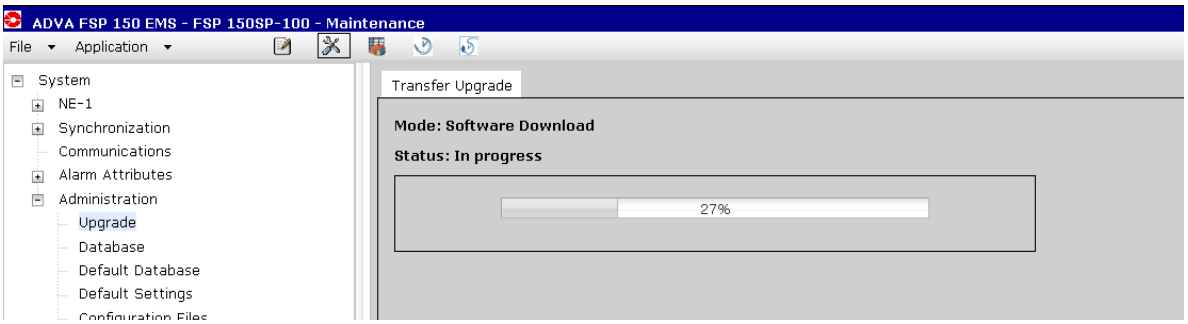
Step 7 Enter the data required in the screen to access the FTP, SFTP or SCP server and begin the file transfer process, and click on **OK**.

Note

It is assumed that the user knows the IP address of the FTP, SFTP or SCP server, has a valid user ID and password and knows the path and file name of the database file to transfer.

The file transfer will begin, and show a screen similar to the following:

Figure 147: File Transfer Progress Screen



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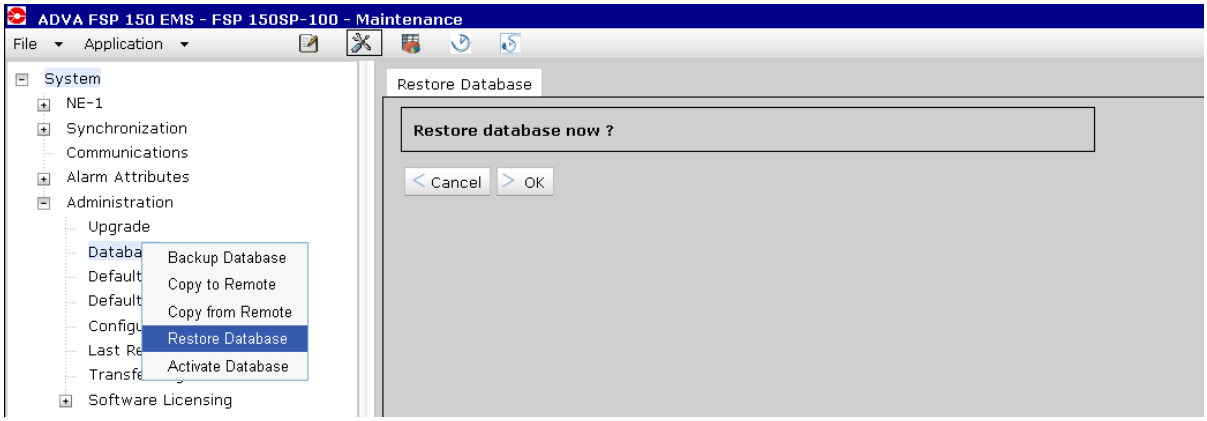
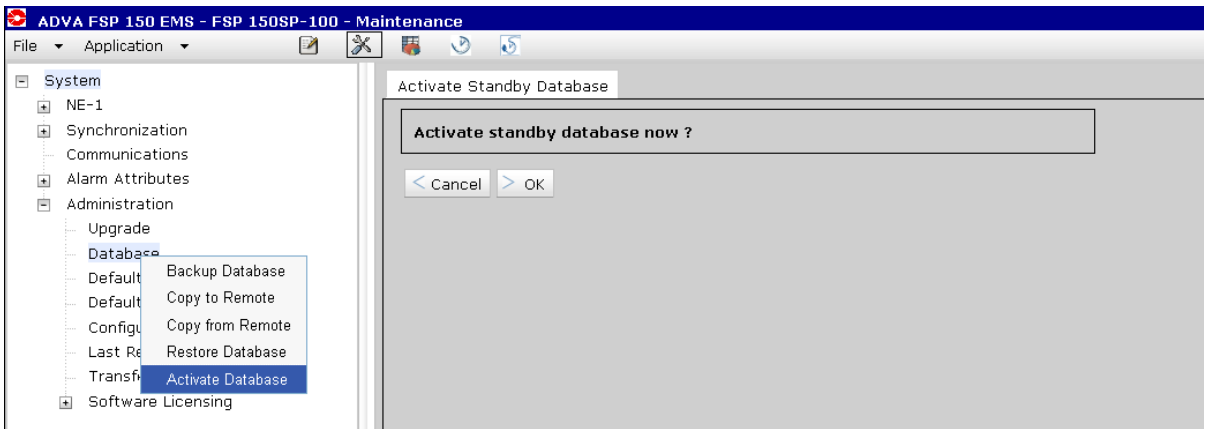
Step 8 When the “Status” changes from “Progress” to “Success”, right click on “Database” in the selection tree pane and select “Restore Database”. The following screen displays:

Figure 148: Restore Database Query



Step 9 Click **OK**, and the screen shows a progress bar. When the restore completes, right click on “Database” in the selection tree pane, then select **Activate Database**. An Activate Standby Database” screen displays, as shown in the following figure:

Figure 149: Activate Standby Database View



Step 10 To accept the restored database, click on **OK**.

Step 11 The NE will reboot.

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Note

If restoring a database taken from a different unit, (e.g. if replacing a failed unit with another unit and restoring a database backup from the first unit) the original unit's SNMP engine ID (snmpEngineId) is preserved so the configured USM auth and priv keys remain valid. If the snmpEngineId is edited, the USM auth and priv keys automatically reset to "ChgMeNOW' and need to be edited.

End of Procedure

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Restore System Defaults

There are two types of database resets available on the FSP 150SP, Restore System Defaults and Restore Factory Defaults. The difference between System Defaults and Factory Defaults is explained in “Determining Database Configuration Status” on p. 236.

CAUTION

Restore System Defaults may result in the loss of all Provisioning Data Base settings including DCN, SNMP, Remote Access and User data. This is normally only done only when a system is decommissioned and moved to a new location or when the software or database is corrupted. It is advisable to backup the database before performing this procedure.

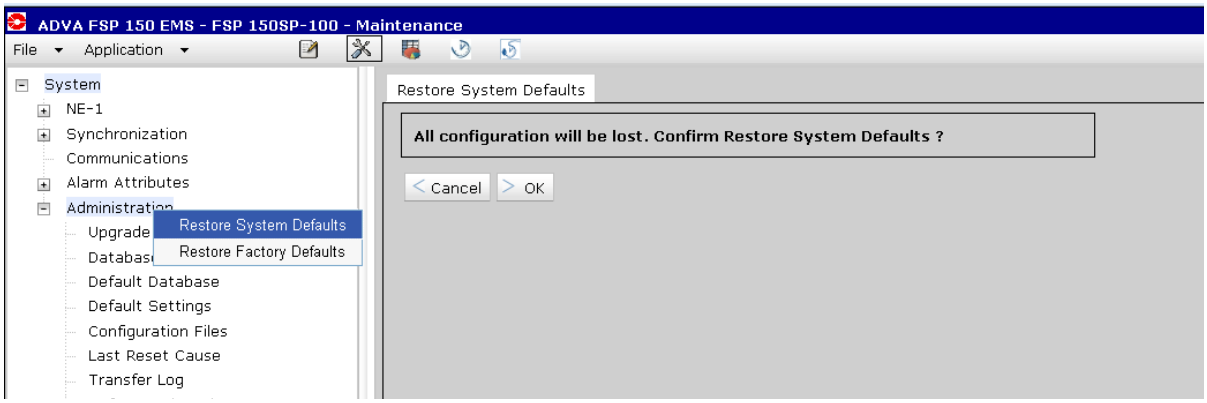
This procedure is **NOT** part of original Provisioning procedures.

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision in Configuration view.

Procedure

Step 1 Click on the Maintenance icon, or select “Maintenance” from the application drop-down list. Right click on “Administration” in the selection tree pane and select **Restore System Defaults** and the following screen displays:

Figure 150: Restore System Defaults



CAUTION

Resetting the database to system defaults may drop all traffic and erase all communications and user settings, including the loss of the eVision connection to the NE. This operation should not be performed lightly. It may be advisable to backup the current database so that it can be restored later.

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Step 2 To reset the system database to the factory defaults, select **OK**.

End of Procedure

Restore Factory Defaults

CAUTION

Restore Factory Defaults results in the loss of all Provisioning Data Base settings including DCN, SNMP, Remote Access and User data. This is normally only done only when a system is decommissioned and moved to a new location or when the software or database is corrupted. It is advisable to backup the database before performing this procedure.

This procedure is **NOT** part of original Provisioning procedures.

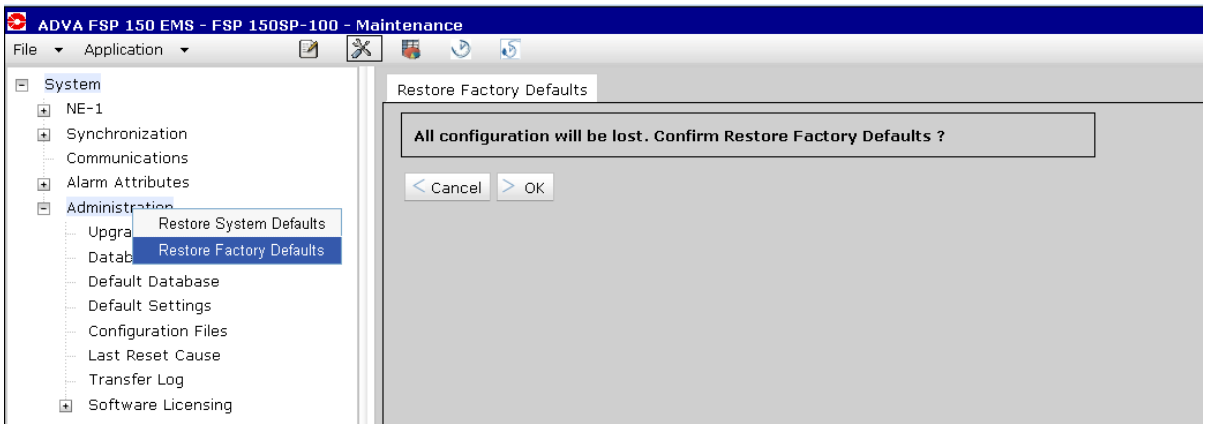
There are two types of database resets available on the FSP 150SP, Restore System Defaults and Restore Factory Defaults. The difference between System Defaults and Factory Defaults is explained in Determining Database Configuration Status, on Page 4-236.

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision in Configuration view.

Procedure

Step 1 Click on the Maintenance icon, or select “Maintenance” from the application drop-down list. Right click on “Administration” in the selection tree pane and select **Restore Factory Defaults** and the following screen displays:

Figure 151: Restore Factory Defaults



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CAUTION

Resetting the database to factory defaults will drop all traffic and erase all communications and user settings, including the loss of the eVision connection to the NE. This operation should not be performed lightly. It may be advisable to backup the current database so that it can be restored later.

Step 2 To reset the current database to the factory defaults, select **OK**.

End of Procedure

CLI Configuration Files

In addition to the ICF database files (see "Database and Configuration Files" on p. 236), the system also supports text based configuration files based on the output from the CLI command "show running config" (see the *FSP 150SP-100 Command Line Reference Guide* and CLI Configuration File Management, on Page 4-255). Since they are text based, they can be viewed and edited. The system supports keeping up to four CLI configuration files in persistent memory. These files can be created, deleted, loaded, marked for execution after rebooting the system or copied to and/or from a remote server using FTP, SFTP or SCP (file transfer protocols). They are mentioned here because they persist in memory after a "Restore System Defaults" or a "Restore Factory Defaults", and since the database restoration requires a reboot, if a CLI configuration file is marked for loading following a reboot, it may change the configuration again immediately following the reboot.

CLI configuration files when executed (Load function), modify the active database one line item at a time. These files are managed using CLI commands (see the *FSP 150SP-100 Command Line Reference Guide*) or eVision. These, or edited versions of these files on an external server, are used to configure newly installed systems to transition from an installation network to the traffic-carrying network or to reprovision a system following a database reset to System or Factory Defaults. The CLI commands for managing configuration files are:

- Description
- List
- Load
- Remove
- Restart-with-configfile
- Save
- Show
- Transfer File

These commands are detailed at "CLI Configuration File Management" on p. 255.

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CLI Configuration File Management

CLI configuration files are text files based on the CLI command “show running-config”. These files reflect the delta between the default and active database at the time they are created, and can be used to reconfigure the system by running them manually or scheduling them for execution upon system resets. The user can create and store up to four files on the system. While these files can not be edited on the system, they can be exported, edited, then imported back onto the system. A file can be created, marked for execution upon system reset, and files can be displayed and deleted.

The CLI configuration files are kept in persistent memory and survive software upgrades and ICF database file resets and restorals. This is important because when either of these events happens the system requires a reset, and if a CLI configuration file is marked for automatic execution, it runs after the reset completes.

The following give some examples of and uses for the CLI configuration files. The full syntax for each related CLI command can be found in the *FSP 150SP-100 Command Line Reference Guide*. Included here is a procedure for dealing with CLI configuration files: “CLI Configuration File Procedure” on p. 258.

Below is a sample configuration file. The configuration file parser looks for the first “remarks” line (lines starting with #) to identify that this is a configuration file and this line should never be edited, or the file will not be run.

```
ADVA:config-file--> show configfile configfile4
      File Name : configfile4
    Description :
        Context : below

# DO NOT EDIT THIS LINE. FILE_TYPE=CONFIGURATION_FILE

#
#CLI:ACCESS PORT-1-1-1-1  Edit
#
home
network-element ne-1
  configure nte ntesp100-1-1-1
    configure access-port access-1-1-1-1

#
#CLI:FLOW-1-1-1-1-1  Create
#
home
network-element ne-1
  configure nte ntesp100-1-1-1
    configure access-port access-1-1-1-1
```

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```
#end
home
admin config-file
ADVA:config-file-->
```

Transfer File

To export or import a configuration file, use the “transfer-file” command:

From the highest level prompt, all configuration file commands are accessed by entering “admin config-file”. The configuration file “transfer-file” command under “config-file” is:

```
ADVA:config-file--> transfer-file <ftp,scp,sftp>
<get,put> <user-name> <password> <ipaddr>
<filename>
```

This command uses the selected file transfer protocol to move a configuration file to (put) or from (get) a remote server.

List

To list all configuration files, use the “list” command, as in:

```
ADVA:config-file--> list
|File Name                        |Description
|---------------------------------|----------------|
|configfile2                      |psu and root
|configfile3                      |
|configfile4                      |
ADVA:config-file-->list
```

The command response shows the filename and the description for the file. The description can be edited using the “description” command.

Restart-with-configfile

The “restart-with-configfile” command is used to force an immediate system reset, then execute the designated configfile. The basic command is:

```
ADVA:config-file--> restart-with-configfile
configfile4 yes
ADVA:config-file-->

U-Boot 2009.03-14408 (Jul 13 2013 - 14:21:19)
MPC83XX
```

Load

To run a configuration file now, use the “load” command, as in:

```
ADVA:config-file--> load configfile4
ADVA:config-file-->
```

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Show

To view the contents of a configuration file, use the “show ConfigFile” command, as in:

```
ADVA:config-file--> show configfile configfile4
      File Name : configfile4
    Description :
        Context : below

# DO NOT EDIT THIS LINE.
FILE_TYPE=CONFIGURATION_FILE

#
#CLI:ACCESS PORT-1-1-1-1  Edit
#
home
network-element ne-1
  configure nte ntesp100-1-1-1
    configure access-port access-1-1-1-1

#
#CLI:FLOW-1-1-1-6-1  Create
#
home
network-element ne-1
  configure nte ntesp100-1-1-1
    configure access-port access-1-1-1-1

#end
home
admin config-file
ADVA:config-file-->
```

Description

To enter or edit the description of a configuration file, use the “description” command, as in:

```
description <configfile-name> <description>
```

The description can be up to 127 characters long, ASCII with no spaces (unless in quotes) or question marks. Example:

```
ADVA:config-file--> description configfile4 "set access6 to EVPL
and create a flow"
ADVA:config-file--> list
|File Name               |Description
|------------------------|--------------------------------|
|configfile2             |psu and root
|configfile3             |
|configfile4             |
ADVA:config-file-->
```

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Remove

To delete a configuration file, use the “remove” command, as in:

```
remove <configfile-name>
```

Example:

```
ADVA:config-file--> remove configfile2
ADVA:config-file--> list
|File Name                |Description
|-------------------------|---------------------------------|
|configfile3              |
|configfile4               |set access1 to EVPL and create a flow
ADVA:config-file-->
```

Configuration File Procedures

Below are two procedures for working with Configuration Files. The first is based on using CLI commands, which is the basis for Configuration Files. The second details how to perform the same operations using eVision.

CLI Configuration File Procedure

The user should be logged on to a CLI session as a superuser, then have entered “admin config-file” at the user prompt. See the *FSP 150SP-100 Command Line Reference Guide* for details on CLI interface operation and commands. Descriptions and examples of the commands referenced in this procedure are given in “CLI Configuration File Management” on p. 255.

Procedure

Step 1 Determine the next step.

Desired Operation	Then
Create a new configuration file	Continue with the next step.
Update an existing configuration file	Go to Step 4.
List/check status of the configuration files	Go to Step 6.
Reboot the system and execute a configuration file	Go to Step 8.
Import/export a configuration file	Go to Step 10.
Run (Load) a configuration file now	Go to Step 12.
View the contents of a configuration file	Go to Step 14.
Edit the description of a configuration file	Go to Step 16.
Delete a configuration file	Go to Step 18.
Done working with configuration files	Go to Step 20.

Step 2 Enter the following command:

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`save <configfile-name>`

Where “configfile-name” is 1 to 32 characters, no spaces or slashes (/).

The configfile will contain the delta between the default database and the current active database.

Step 3 Go to Step 1.

Step 4 Enter the following command:
`save <configfile-name>`

Where “configfile-name” is an existing configfile.

The configfile will contain the delta between the default database and the current active database and will overwrite the existing file.

Step 5 Go to Step 1.

Step 6 Enter the following command:
`list`

Step 7 Go to Step 1.

Step 8 Enter the following command:
`restart-with-configfile <configfile-name> yes`

Where “configfile-name” is the an existing configfile.

This will result in an immediate reboot of the system followed by an execution of the designated configfile.

Step 9 Go to Step 1.

Step 10 Enter the following command:
`transfer-file <ftp,scp,sftp> <get,put> <user-name> <password> <ipaddr> <filename>`

This command uses the selected file transfer protocol to move a configuration file to (put) or from (get) a remote server. The IP address of the server, a valid username, password, and configfile-name are required for either get or put operations.

Step 11 Go to Step 1.

Step 12 Enter the following command:
`load <configfile-name>`

Where “configfile-name” is the an existing configfile.

Step 13 Go to Step 1.

Step 14 Enter the following command:
`show <configfile-name>`

Where “configfile-name” is an existing configfile.

Step 15 Go to Step 1.

Step 16 Enter the following command:
`description <configfile-name> <description>`

Where “configfile-name” is an existing configfile. The description can be up to 127 characters long, ASCII with no spaces or question marks (unless the text string is in quotes).

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Step 17 Go to Step 1.

Step 18 Enter the following command:

```
remove <configfile-name>
```

Where “configfile-name” is an existing configfile.

Step 19 Go to Step 1.

Step 20 If configuration changes were implemented using this procedure, verify the changes, then save the configuration using the “Create a Database Backup” on p. 244 procedure.

End of Procedure

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Configuration File Procedure - Using eVision

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision in Maintenance view.

Procedure

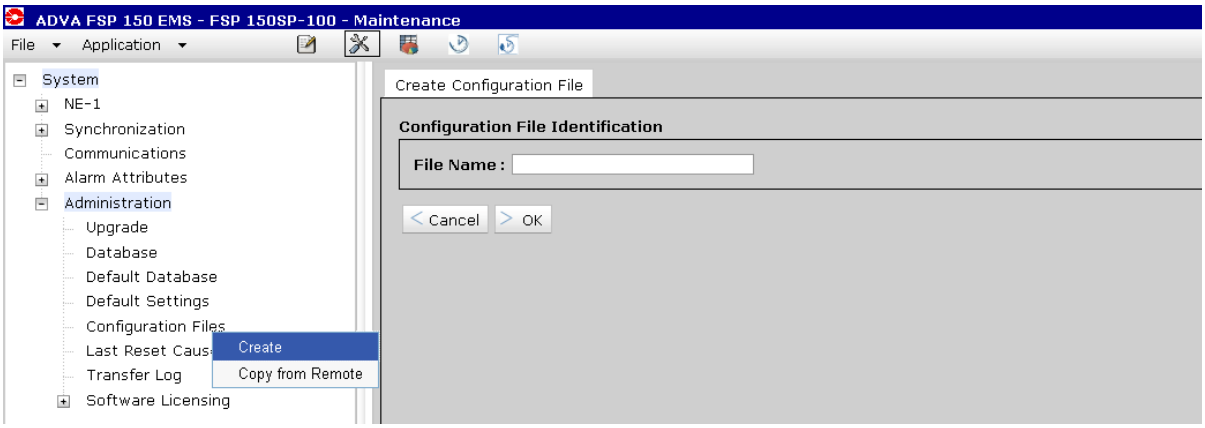
Step 1 Click on the maintenance icon, or select “Maintenance” from the application drop-down list. Expand the “Administration” entity.

Step 2 Determine the next step.

Desired Operation	Then
Create a new configuration file	Continue with the next step.
Update an existing configuration file	Go to Step 6.
List/check status of the configuration files	Go to Step 9.
Reboot the system and execute a configuration file	Go to Step 11.
Import a configuration file	Go to Step 13.
Export a configuration file	Go to Step 16.
Edit the description of a configuration file	Go to Step 19.
Delete a configuration file	Go to Step 22.
Done working with configuration files	Go to Step 25.

Step 3 Right click on “Configuration Files” and select **Create**. The following screen displays:

Figure 152: Configuration Files - Create



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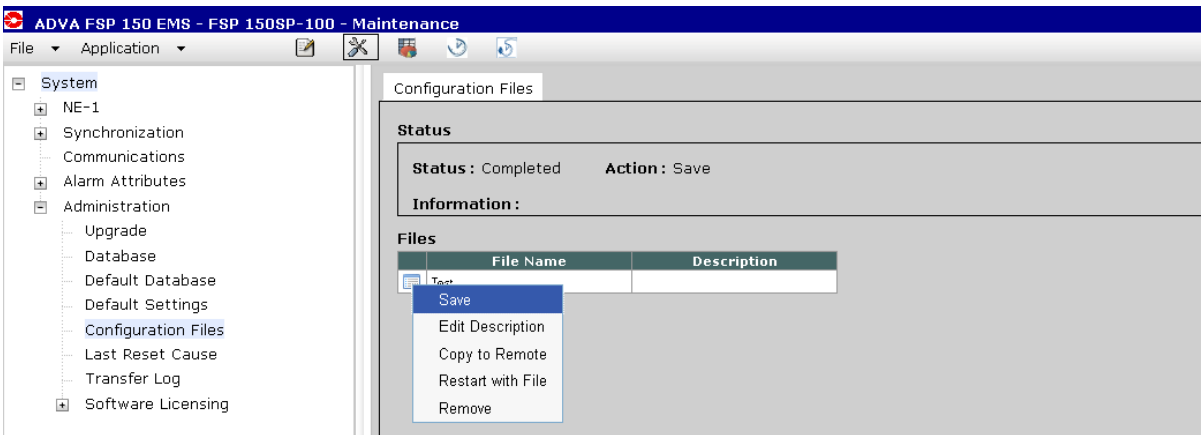
Step 4 Enter the desired File Name, no spaces or slashes (/). Then select **OK**.

The configuration file will contain the delta between the default database and the current active database.

Step 5 Go to Step 2.

Step 6 Select “Configuration Files” then right click on the menu icon beside the desired configuration file name in the table inside the details pane. The following screen displays:

Figure 153: Configuration Files - Update



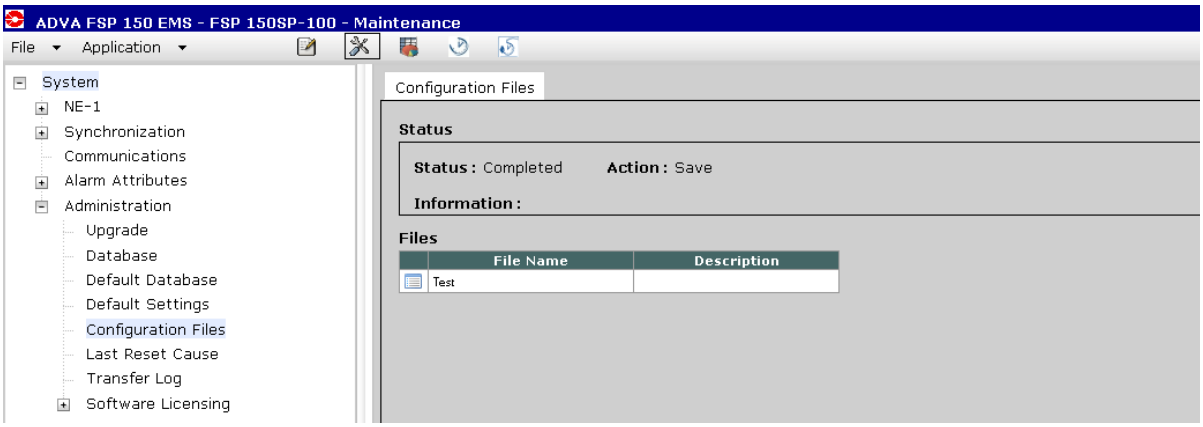
Step 7 Select **Save**.

The configfile is updated and contains the delta between the default database and the current active database and overwrites the existing file.

Step 8 Go to Step 2.

Step 9 Select “Configuration Files”. The following screen displays:

Figure 154: Configuration Files - Display Status



The details pane shows a table of the existing configuration files including the file name and description (if any).

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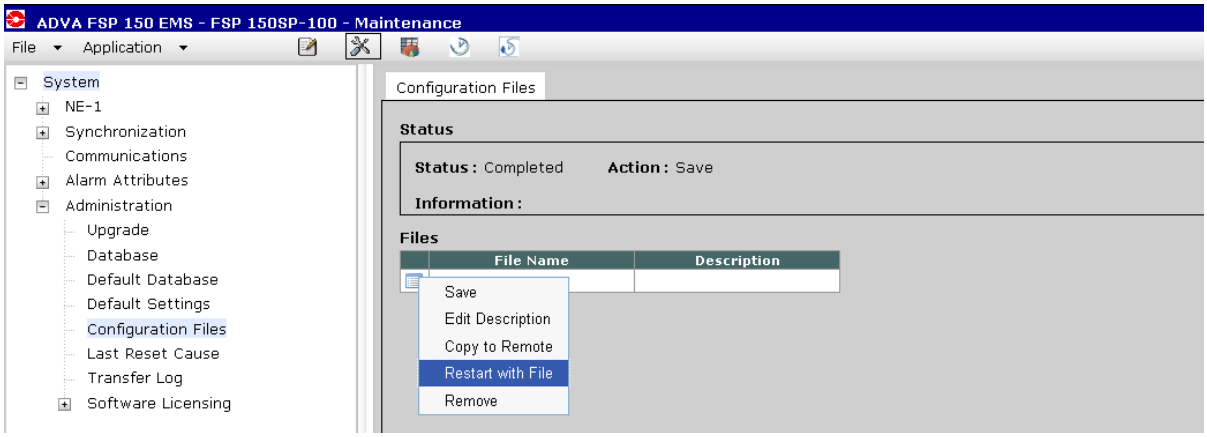
Step 10 Go to Step 2.

Step 11 Select “Configuration Files” then right click on the menu icon beside the desired configuration file name in the table inside the details pane. The following screen displays:

Figure 155: Configuration Files - Restart



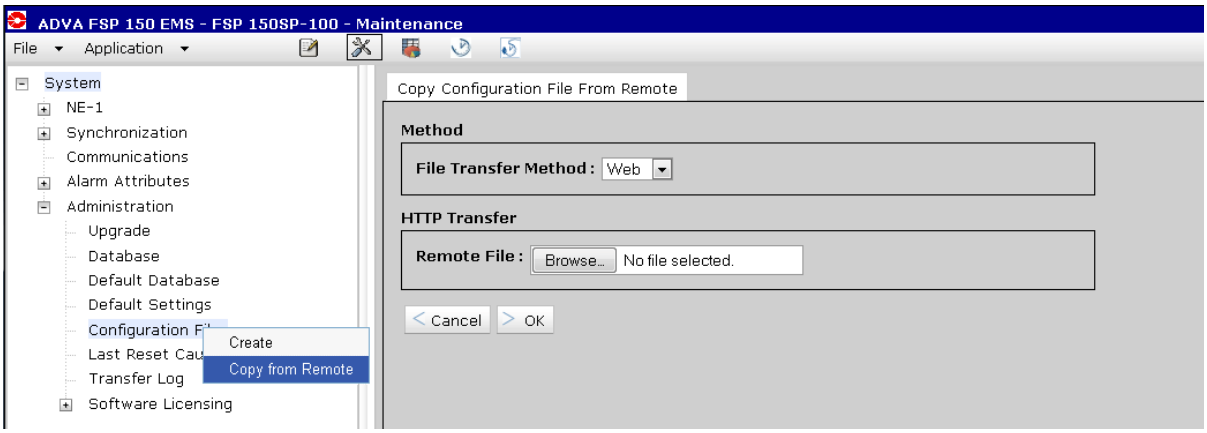
Step 12 Select **Restart with File**.

The NID is rebooted, then the selected configfile is run.

End of Procedure

Step 13 Right click on “Configuration Files” and select **Copy From Remote**. The following screen displays:

Figure 156: Configuration Files - Import



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Step 14 Select the desired protocol and enter the configuration file name:

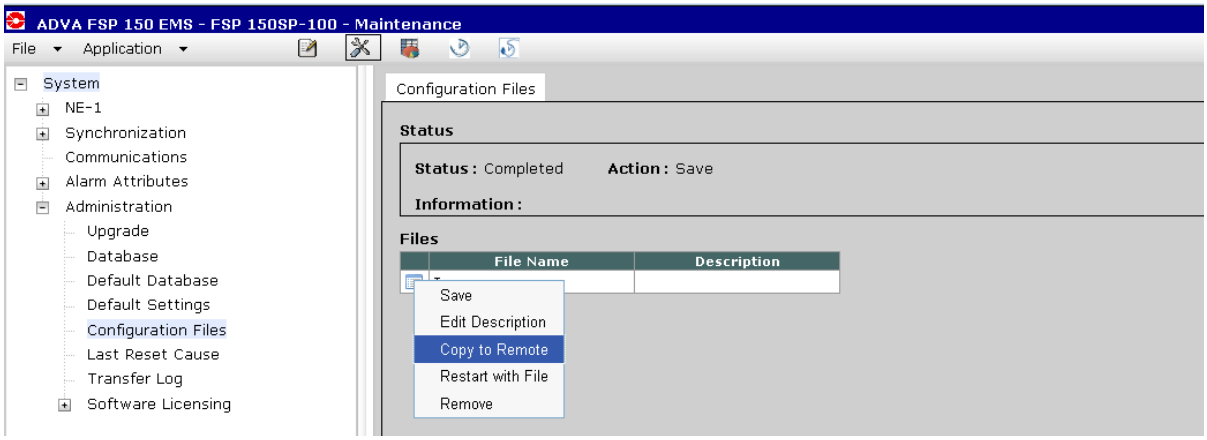
The selected file transfer protocol is used to move a configuration file from (get) a remote server. The IP address of the server, a valid user-name, password, and configfile-name are required if using FTP, SFTP or SCP protocols.

Select **OK**.

Step 15 Go to Step 2.

Step 16 Select “Configuration Files” then right click on the menu icon beside the desired configuration file name in the table inside the details pane. The following screen displays:

Figure 157: Configuration Files - Export



Step 17 Select **Copy to Remote**.

Follow the instructions in the detail pane to move the selected configuration file to the remote location using the selected transfer protocol.

Step 18 Go to Step 2.

Step 19 Select “Configuration Files” then right click on the menu icon beside the desired configuration file name in the table inside the details pane. The following screen displays:

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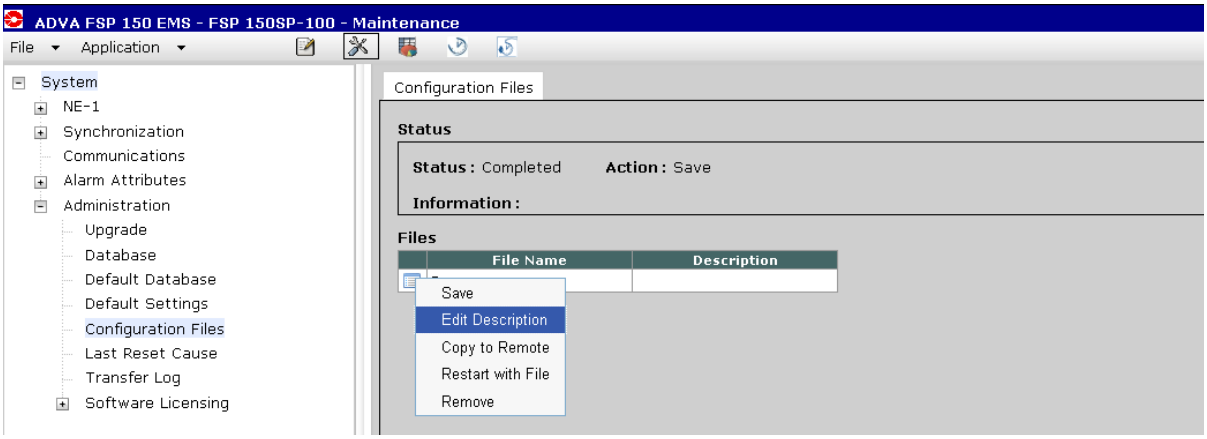
Figure 158: Configuration Files - Edit Description



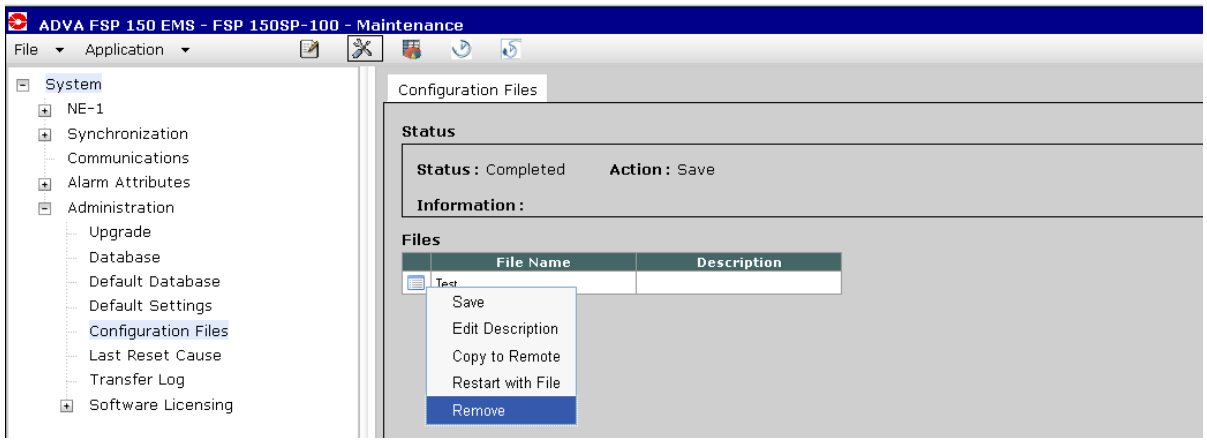
Step 20 Select **Edit Description**.

A text editing window opens. Enter the desired description, up to 127 ASCII characters and click on **OK**.

Step 21 Go to Step 2.

Step 22 Select “Configuration Files” then right click on the menu icon beside the desired configuration file name in the table inside the details pane. The following screen displays:

Figure 159: Configuration Files - Remove



Step 23 Select **Remove**.

The selected configuration file is deleted.

Step 24 Go to Step 2.

Step 25 If configuration changes were implemented using this procedure, verify the changes, then save the configuration using the procedure “Create a Database Backup” on p. 244.

End of Procedure

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Default Settings Value File

CAUTION

Installing a Default Settings Value File changes the settings applied when a new entity or object is created. The Factory Default settings were carefully vetted to avoid potential serious conflicts in these settings. Changing them may result in corruption of the database or inability to work with certain created objects. This procedure should only be done by properly trained personnel with a file that was tested in a lab to ensure proper operation. Restore Factory Defaults will erase any user defined Default Settings file.

This procedure is **NOT** part of original Provisioning procedures.

If the user has determined that the default value settings applied when a new entity is created are not applicable or unacceptable, an XML file containing alternate settings can be downloaded and applied to the FSP 150SP using the following procedure.

The following procedure includes steps for performing applying a new Default Settings file using the eVision tool. It is also possible to perform this process using CLI. See the *FSP 150SP-100 Command Line Reference Guide* for details. The following procedure also assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

Procedure

Step 1 Click on the maintenance icon, or select “Maintenance” from the application drop-down list.

Step 2 Expand “Administration” and select “Default Settings”

The display is the Copy System Default Settings From Remote view, shown in the following figure:

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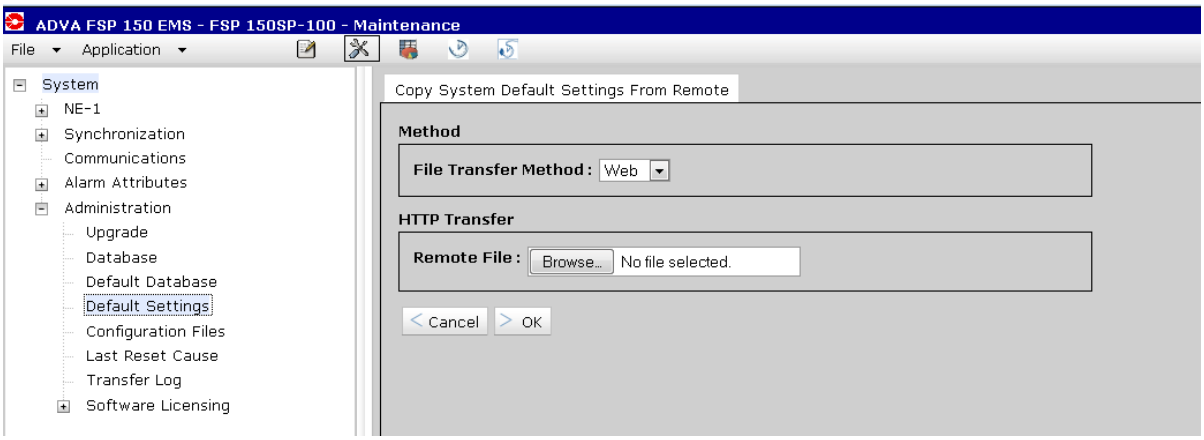
Figure 160: Copy System Default Settings From Remote - Web View



Step 3 Determine the next step.

Desired File Transfer Method	Then
Web (HTTP)?	Continue with the next step.
FTP, SFTP or SCP?	Go to Step 5.

Step 4 Enter the path to the file to copy, or browse to the file location, then click on **OK**.

The file is copied from the source location and the Detail Pane indicates when the file transfer is 100% complete.

End of Procedure

Step 5 For “File Transfer Method” select **FTP**, **SFTP** or **SCP** from the drop-down list.

The display changes to the FTP, SFTP or SCP file transfer view, shown in the following figure: (The figure shows the SCP view, the FTP and SFTP views are identical.)

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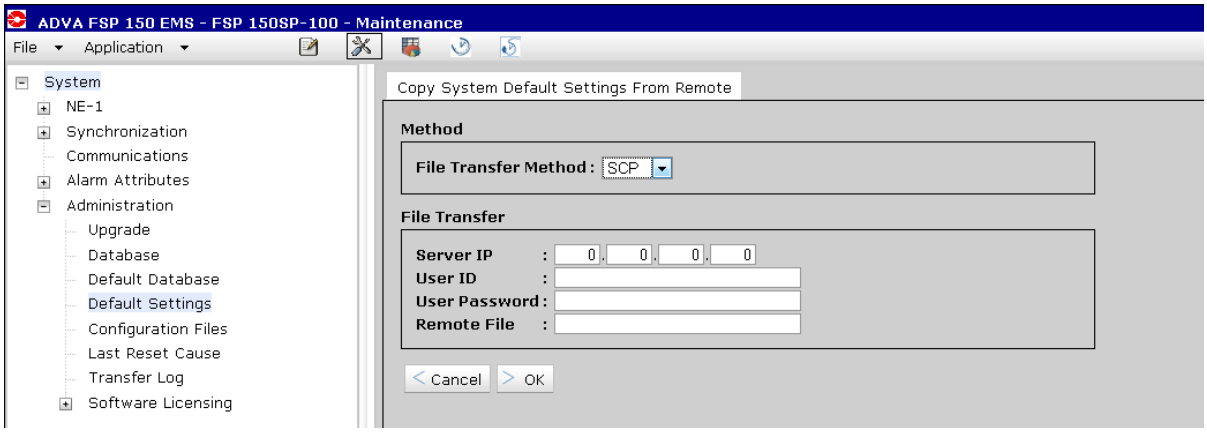
Figure 161: Copy System Default Settings From Remote - SCP View



Step 6 Enter the data required in the screen to access the FTP, SFTP or SCP server and begin the file transfer process, and click on **OK**.

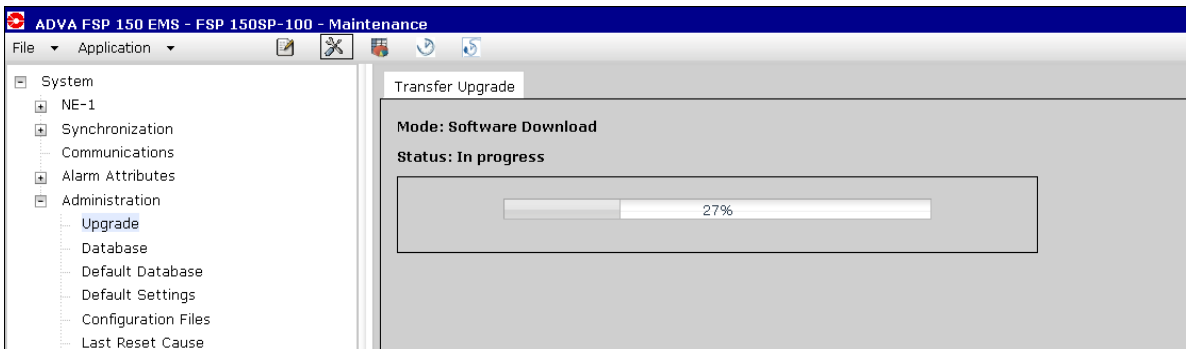
.

Note

It is assumed that the user knows the IP address of the FTP, SFTP or SCP server, has a valid user ID and password and knows the path and file name of the database file to transfer.

The file transfer begins, and show a screen similar to the following displays.

Figure 162: File Transfer Progress Screen



Step 7 When the “Status” changes from “Progress” to “Success”.

End of Procedure

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Bulk Log Transfer

The Audit Log, Alarm Log and Security Log can be bulk transferred to a remote repository. The NE supports transfer via HTTPS (Web), FTP, SFTP and SCP protocols. Transferring the Security Log requires the user to have Superuser access.

The following procedure includes steps for performing the bulk file transfer process using the eVision tool. It is also possible to perform this process using CLI. See the *FSP 150SP-100 Command Line Reference Guide* for details. The following procedure also assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN (see "Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port" on p. 276) and is logged on using eVision.

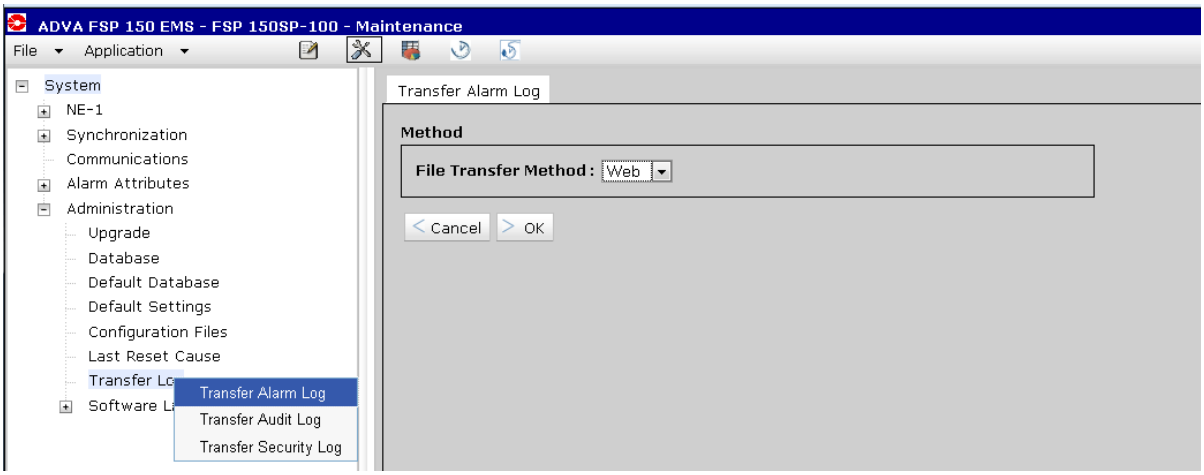
Procedure

Step 1 Click on the maintenance icon, or select "Maintenance" from the application drop-down list.

Step 2 Expand "Administration", right click on "Transfer Log" and select the desired log file to Transfer (Alarm Log, Audit Log, Security Log).

The display is the Transfer Log view, shown in the figure below. The examples use the Alarm Log, all others are similar.

Figure 163: Transfer Log View



Step 3 Determine the next step.

Desired File Transfer Method	Then
Web (HTTP)?	Continue with the next step.
FTP, SFTP or SCP?	Go to Step 7.

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Step 4 Select Web then click on **OK**.

You are prompted to open or save the file. Select the save option to save the file.

The options presented for file saving are dependant on the browser being used and the options the user has selected for browser operation. For example, MS Internet Explorer will prompt for file name and where the file should be saved, Firefox will save the file with the default file name to the computer desktop.

Note

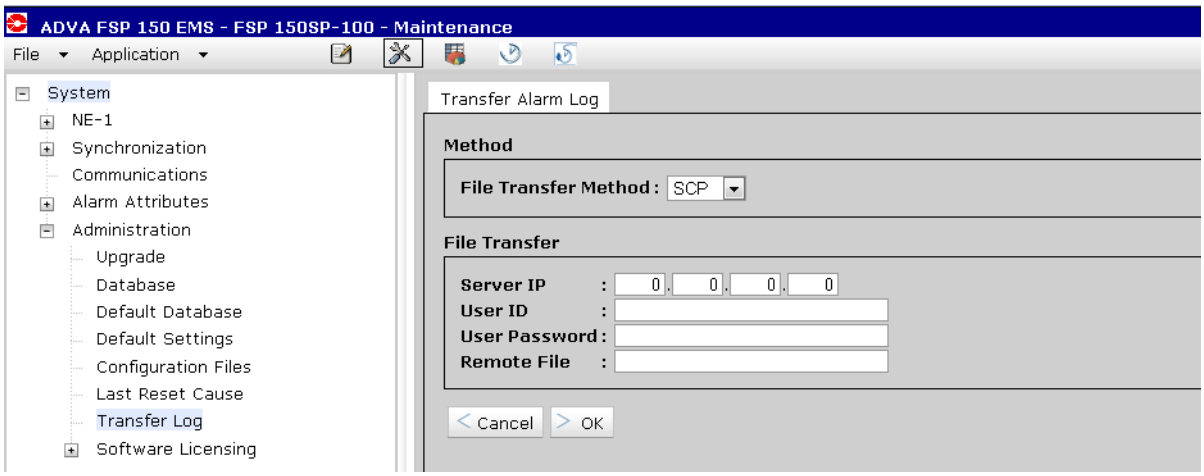
A browser with File Download Prompting enabled and pop-up blocking enabled may not allow a transferred file to be successfully downloaded to the system. With this configuration, the system logs may indicate successful file download, when the browser has not properly saved the file. The file may be successfully downloaded and saved by either disabling configuration of File Download Prompting or disabling pop-up blocking; or using the browser's pop-up override capability to allow the file save to complete.

End of Procedure

Step 5 For "File Transfer Method" select **FTP**, **SFTP** or **SCP** from the drop-down list.

The display changes to the FTP, SFTP or SCP file transfer view, shown in the figure below. (The figure shows the SCP view, the FTP and SFTP views are identical.)

Figure 164: Bulk Log Transfer - SCP View



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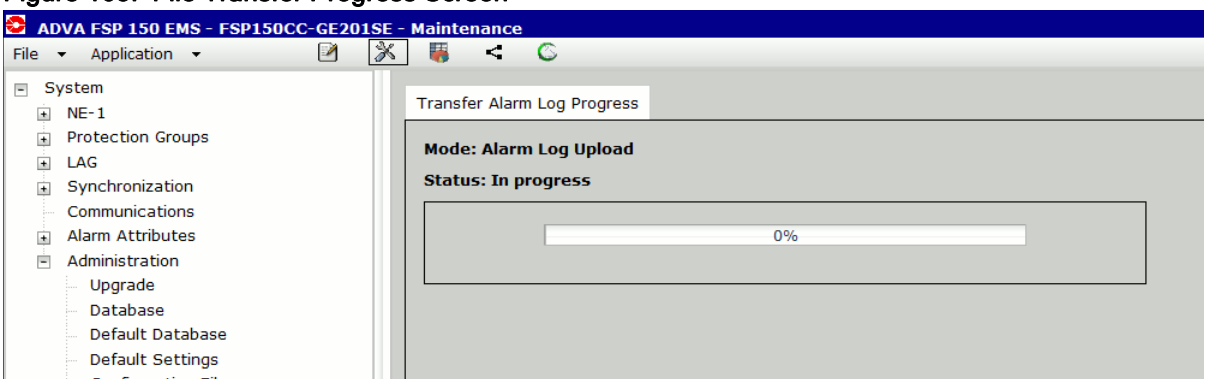
Step 6 Enter the data required in the screen to access the FTP, SFTP or SCP server and begin the file transfer process, and click on **OK**.

Note

It is assumed that the user knows the IP address of the FTP, SFTP or SCP server, has a valid user ID and password and knows the path and file name of the software file to transfer.

The file transfer will begin, and show a screen similar to the following displays.

Figure 165: File Transfer Progress Screen



Step 7 When the “Status” changes from “In Progress” to “Success”, the file has been transferred.

End of Procedure

Test the FSP 150SP

See Chapter. 6 “Etherjack/Syncjack Test Procedures, and Performance Monitoring” on p. 319

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Chapter 5

Communications Provisioning

Introduction

This Chapter contains communications provisioning information and procedures for the SP-100. An example scenario of Gateway Network Element (GNE) to Subtending NE (SNE) communications is provided along with provisioning details. This section contains the following communications procedures:

- "Serial Connection" on p. 276
- "Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port" on p. 276
- "Set Up the 3G Modem Using the Serial Port" on p. 282
- "Browser-based IP Connection" on p. 285
- "Edit DCN (eth0) Configuration" on p. 286
- "Configure Management Tunnel" on p. 290
- "Configure Source Address" on p. 298
- "Add/Delete Static Route" on p. 299
- "Add/Delete Static ARP Entry" on p. 302
- "Configure Access Control List (ACL)" on p. 304
- "Configure 3G Modem Using eVision" on p. 304
- "Sample Network - GNE to SNE over Management Tunnel" on p. 313

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Provision Communications

The FSP 150SP supports several management configurations and options. This section does not provide typical deployment scenarios of the FSP 150SP in common IP network configurations as there are simply too many different network configurations in common use as to be practical.

Additionally, most entities deploying the product have network administrators who either do the provisioning or provide work orders with provisioning details. This section also does not provide a comprehensive explanation of IP networking concepts.

The factory default settings for the FSP 150SP provide for connecting the MGMT LAN (DCN) RJ45 connector to the local/remote DCN. This interface (eth0) is preconfigured by factory defaults with Dynamic Host Configuration Protocol (DHCP) in client mode with the DHCP function disabled.

The user can ascertain quickly the status of the DCN by using the RS-232 serial port to query the NE for the DCN settings. This same interface can be used to enable DHCP or set the IP address of the eth0 interface if DHCP is not used on the DCN.

The user has the option of deploying the unit with settings other than the factory defaults and/or establishing a system default database (see “Database and Configuration Files” on p. 236) with user specified DCN settings or configuring a management tunnel on one or more Network or Access Ports.

The system also supports Management Traffic Bridging, which implements an Ethernet Bridge between the Management LAN (eth0) and all configured Management Tunnels. This allows having only a single IP address for all management interfaces on the system and eliminates the need for static routes, routing protocols or proxy ARP in an SNE/GNE configuration. The Ethernet Bridge functionality supports MAC learning and flooding of un-learned MAC addresses. If Management Traffic Bridging is Enabled (see “System Configuration Settings” on p. 464), management tunnels do not support provisioning for IP Address, Subnet Mask, DHCP or RIP. Another system level option, Management Traffic Bridging Security, limits acceptance of DCN packets to those with source MACs containing an ADVA Optical Networking OUI. Management Traffic Bridging also facilitates the use of a Hot Sparing configuration.

Note

When bridging is disabled, existing http/https/telnet/ssh sessions are unresponsive for up to 3 seconds
When bridging is enabled, existing http/https/telnet/ssh sessions are unresponsive for up to 10 seconds

Management Communication to the FSP 150SP

A connection can be made between a PC or laptop and the FSP 150SP management interface using Command Line Interface (CLI) on a direct local serial link. However, to connect to the FSP 150SP from a remote DCN, connection can also be made via a DCN network.

A valid IP address for the Management LAN Interface is required when connecting via the DCN. Although the FSP 150SP is shipped with a default IP address

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loaded (192.168.0.2 / 24), the default is the same for each unit. To ensure a reliable connection to the FSP 150SP, the IP address of the Management LAN Interface should first be configured to a unique address compatible with the network it is on. This is usually performed automatically by using DHCP or manually by making a serial connection to the FSP 150SP and performing IP Configuration during installation. See "Serial Connection" on p. 276 for further details.

Note

Regarding examples shown:
The use of a PC or Laptop running Microsoft (MS) Windows and the terminal emulation program detailed in this section are used as illustrations only. Other terminal emulation programs, run on a preferred platform may be used instead. For more information contact ADVA Optical Networking Technical Support using the contact details given in the Preface, Technical Support.

It is outside of the scope of this document to describe the use of any computer operating system, terminal emulation program or internet browser, either recommended or otherwise. If further details are required on the use of a particular program, please refer to the documentation supplied with it.

Regarding login user names and passwords:
The default password for access to the management interface is `ChgMeNOW`. This password is used on first access to:

(a) the **`root`**, **`netadmin`** or **`user`** account
(b) an account which has been changed by an administrator

Note

When logging in using the default password, a password change is enforced. This minimizes possible exposure, restricts access to the system and thereby increases system security. See Configure Local Users, on Page 4-176 for details on changing a password.

All account names and passwords are case sensitive.

When using the local password file for user authentication a login account is locked for a period of 5 minutes after 3 unsuccessful login attempts.

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Serial Connection

Information on using CLI commands utilizing the serial port are found in the *FSP 150SP-100 Command Line Interface Reference Guide*.

Procedure

To make a serial connection to the FSP 150SP, perform the following steps:

Step 1 Ensure that a physical serial connection from a PC or Laptop to the FSP 150SP RS-232 connector has been established (see "Serial Console Port Connection" on p. 118).

Step 2 Start a serial terminal emulation program (e.g. Tera Term Web) to establish a connection.

Step 3 Select the outgoing communication port.

Step 4 Set the communication settings of the terminal emulation program to the following:

- 9600 baud
- 8 data bits
- no parity bit
- 1 stop bit
- No flow control

Step 5 Save these settings for future use.

The following Login prompt should be displayed:

```
Login:
```

Step 6 Login with the following details:

- Account name - `root` (or as appropriate, see "Provision Secure Access" on p. 171)
- Password - `ChgMeNOW` (or as appropriate).

A Security Banner displays on the screen.

Step 7 Enter "Y" to continue.

The following prompt is displayed:

ADVA-->

End of Procedure

Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port

The following procedure assumes that the ethernet cable connecting MGMT LAN to the DCN network has not been installed yet. (If there is no DCN connected and only a 3G DCN will be provided for this SP-100, refer to "Set Up the 3G Modem Using the Serial Port" on p. 282 to provision the 3G DCN USB port using CLI commands.)

Perform the following procedure to set up the FSP 150SP DCN (eth0) port (MGMT LAN) using the RS-232 Serial Port on the FSP 150SP (RS 232) and the

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CLI command structure. (For more information on the CLI command structure, see the *FSP 150SP-100 Command Line Interface Reference Guide*.)

You will need the following items for this procedure:

- PC with a serial communications port (e.g., COM1 or COM2)
- 2 Category 5 LAN Cables (with RJ-45 connectors)
- DB-9 to RJ-45 converter (ADVA Optical Networking PN 2036904035-01 or 1036904035, see Table 65: RJ-45 (RS-232 Serial Console Port) and DB9 Adapter Pin Assignments on p. 575)
- A communications program, like TeraTerm Pro Web (a free software terminal emulator for MS-Windows)
- An Internet browser [e.g. Internet Explorer 5.0 or greater (IE 8.0 recommended) or Firefox 2.0 or greater (Firefox 3.6 recommended), etc.] This procedure is intended to be used during the commissioning process or used as a stand-alone procedure.

This procedure is intended to be used during the commissioning process or used as a stand-alone procedure.

The default DHCP setting for the FSP 150SP DCN port is **disabled** and as a **DHCP client**.

This procedure is offered as the best way to set up the FSP 150SP IP address using the CLI command structure by connecting to the RS-232 Serial Console Port (RS 232 on the SP-100) and your PC. If a DHCP server is not available for the DCN port, then DHCP must be **disabled**. Note that by default, DHCP is disabled on the DCN, and as a DHCP client.

The IP addresses and Subnet Masks entries shown in these procedures are for example purposes only. The information you enter should be determined from local sources.

Procedure

Step 1 Connect a serial cable between the FSP 150SP RS-232 Serial Port and a PC and logon using procedure: “Serial Connection” on p. 276.

Step 2 Enter the **show ip-interface eth0** command to view the current DHCP setting for the DCN interface on the FSP 150SP. See the following example:

```
ADVA--> show ip-interface eth0
                      Name : eth0
                IP Address : 0.0.0.0
                   Netmask : 255.255.255.255
                 DHCP Role : dhcp-client
                      DHCP : enabled
            DHCP Client ID : FSP 150SP-100
                     RIPv2 : disabled
                MTU (bytes) : 1500
                   MAC Address : 00:80:ea:02:62:01
          System Default Gateway : 0.0.0.0
```

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Step 3 Determine the next step.

Current Status	Then
Is the **eth0** port DHCP status set to the desired state of Disabled?	Go to Step 7.
Is the **eth0** port DHCP status set to the desired state of Enabled?	Go to Step 23.
Does the **eth0** port DHCP setting need to be changed?	Continue with the next step.

Step 4 Enter the **configure communication** command. A next level prompt appears. Then enter **configure eth0 dhcp-control enabled** or **dhcp-control disabled** to set the desired DHCP state. For example:

```
ADVA--> configure communication
ADVA:comms--> configure eth0 dhcp-control enabled
ADVA:comms-->
```

Step 5 Enter the **show eth0** command to verify the changes.

Step 6 Determine the next step.

Current Status	Then
Is the **eth0** port DHCP status set to the desired state of Disabled?	Go to Step 8.
Is the **eth0** port DHCP status set to the desired state of Enabled?	Go to Step 23.

Step 7 Enter the **configure communication** command. A next level prompt will appear. For example:

```
ADVA--> configure communication
ADVA:comms-->
```

Note

Usually, the IP address and network mask information is supplied by the network administrator.

Step 8 Enter **configure eth0** followed by a valid IP address, network mask and default gateway for the DCN network the NE will be connected to. For example:

```
ADVA:comms--> configure eth0 ip-address
172.17.11.33 255.255.255.0 172.17.11.1
ADVA:comms-->
```

Step 9 Enter the **show eth0** command to view the current IP address and network mask setting for the DCN interface on the SP-100. See the following example:

```
ADVA:comms--> show eth0
                    Name : eth0
              IP Address : 172.17.11.33
                 Netmask : 255.255.255.0
```

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```
                DHCP Role : dhcp-client
                     DHCP : disabled
           DHCP Client ID : FSP 150SP-100
                    RIPv2 : disabled
               MTU (bytes) : 1500
          Physical Address : 00:80:ea:02:62:01
System Default Gateway : 0.0.0.0
```

Step 10 Determine the next step.

Current Status	Then
Is the IP address and mask wrong?	Go to Step 8.
Is the IP address and mask correct?	Proceed to the next step.

Step 11 Enter the **show system** command and verify that HTTP and HTTPS are enabled.

Step 12 Determine the next step.

Current Status	Then
Are both HTTP and HTTPS enabled?	Go to Step 15.
Is HTTP and/or HTTPS disabled?	Proceed to the next step.

Step 13 Enter the following highlighted CLI commands to enable both HTTP and HTTPS.

```
ADVA:comms--> home
ADVA--> configure system
ADVA:system--> http enabled
ADVA:system--> https enabled
```

Step 14 Go to Step 11

Step 15 Use an ethernet cable to connect the MGMT LAN RJ-45 connector to the network DCN.

Step 16 Open a browser window and use the configured IP address to access the NE.

Step 17 Determine the next step.

Current Status	Then
Did a login screen display?	Proceed to the next step.
Did the connection to the NE fail?	Check that you entered the IP address correctly, that the PC is connected to the network DCN and has a valid IP address itself, that the NE is connected to the network DCN and that the NE's IP address is set correctly. If necessary, return to Step 2.

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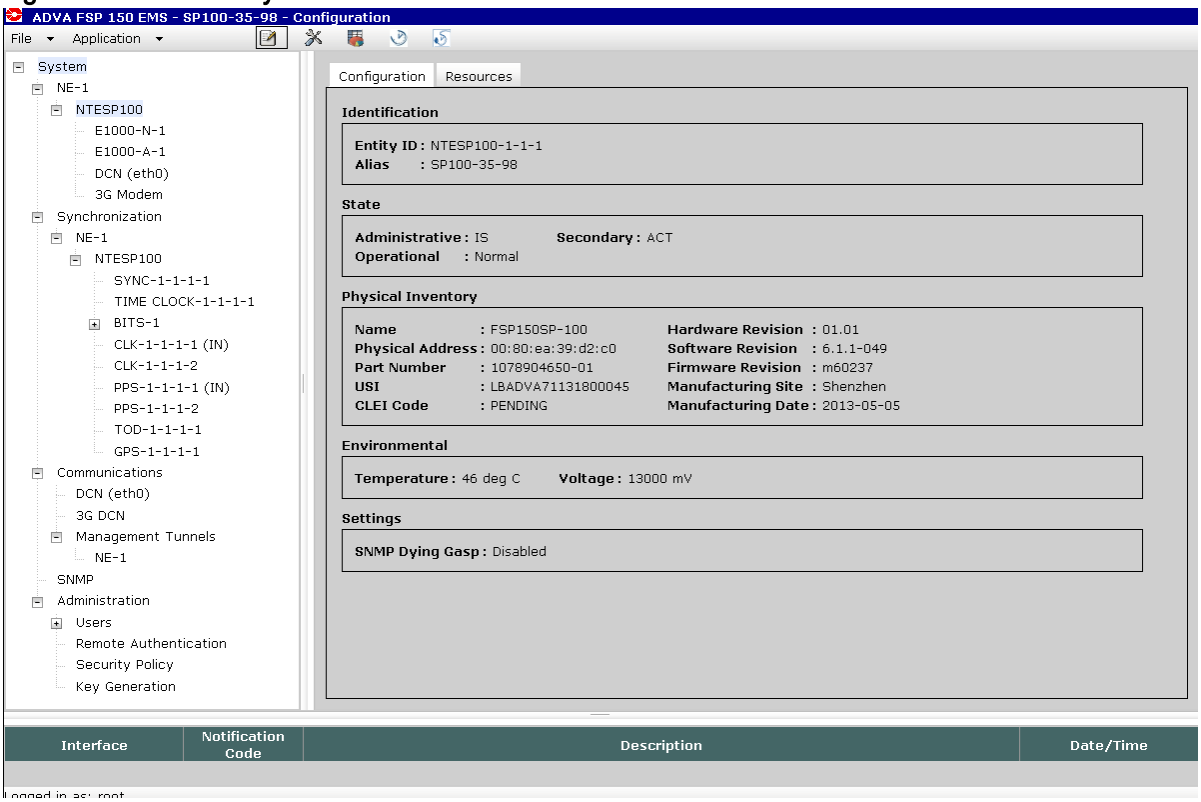
Step 18 Enter a valid login User ID and Password. The default login and password are '**root**' and '**ChgMeNOW**,' respectively. The security banner will then be displayed.

Step 19 Click on the "Continue" button, and a display similar to the following will appear.

Figure 166: eVision System View



Step 20 From the "File" menu, select "Logout", and verify that the browser shows the Login screen.

Step 21 Return to the serial port session and logoff by entering **quit**. See the following example

```
ADVA:comms--> quit
Logged Out

Login:
```

Step 22 Disconnect the serial cable from the RS 232 connector on the FSP 150SP.

End of Procedure

Step 23 Use an ethernet cable to connect the MGMT LAN RJ-45 connector to the network DCN.

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Step 24 Enter the **show ip-interface eth0** command to view the current DHCP setting for the DCN interface on the FSP 150SP. See the following example:

```
ADVA--> show eth0
                        Name : eth0
                  IP Address : 172.17.11.33
                     Netmask : 255.255.255.0
                   DHCP Role : dhcp-client
                        DHCP : enabled
             DHCP Client ID : FSP 150SP-100
                       RIPv2 : disabled
                  MTU (bytes) : 1500
              Physical Address : 00:80:ea:02:62:01
    System Default Gateway : 172.17.22.1
```

Step 25 Determine the next step.

Current Status	Then
Is the IP address something other than 0.0.0.0?	Proceed to the next step.
Is the IP address still 0.0.0.0?	Wait a one minute, then retry Step 24. If after 4 attempts, the IP address still does not appear, contact your System Administrator. When an IP address other than 0.0.0.0 is present, proceed to the next step.

Step 26 Enter the **show system** command and verify that HTTP and HTTPS are enabled.

Step 27 Determine the next step.

Current Status	Then
Are both HTTP and HTTPS enabled?	Go to Step 30.
Is HTTP and/or HTTPS disabled?	Proceed to the next step.

Step 28 Enter the following highlighted CLI commands to enable both HTTP and HTTPS.

```
ADVA:comms--> home
ADVA--> configure system
ADVA:system--> http enabled
ADVA:system--> https enabled
```

Step 29 Go to Step 26

Step 30 Open a browser window and use the configured IP address to access the NE.

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Step 31 Determine the next step.

Current Status	Then
Did a login screen display?	Proceed to the next step.
Did the connection to the NE fail?	Check that you entered the IP address correctly, that the PC is connected to the network DCN and has a valid IP address itself, that the NE is connected to the network DCN and that the NE's IP address is correct. If necessary, return to Step 24.

Step 32 Enter a valid login User ID and Password. The default login and password are '**root**' and '**ChgMeNOW**,' respectively. The warning banner will then be displayed.

Step 33 Click on the "Continue" button, and a display similar to Figure 166 on p. 280 appears.

Step 34 From the "File" menu, select "Logout", and verify that the browser shows the Login screen.

Step 35 Return to the serial port session and logoff by entering **quit**. See the following example

```
ADVA:comms--> quit
Logged Out


login:
```

Step 36 Disconnect the serial cable from the RS 232 connector on the FSP 150SP.

End of Procedure

Set Up the 3G Modem Using the Serial Port

The following procedure assumes that the 3G modem has been installed, either directly into the USB port or through a USB cable (if required). (Use this procedure for DCN connection backup purpose when the DCN (eth0) port is disabled or the DCN connection is unavailable, and when the system is not working in management traffic bridging mode.)

Perform the following procedure to set up the 3G modem port using the RS-232 Serial Port on the FSP 150SP (RS 232) and the CLI command structure. (For more information on the CLI command structure, see the *FSP 150SP-100 Command Line Interface Reference Guide*.)

You will need the following items for this procedure:

- PC with a serial communications port (e.g., COM1 or COM2)
- 2 Category 5 LAN Cables (with RJ-45 connectors)

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- DB-9 to RJ-45 converter (ADVA Optical Networking PN 2036904035-01 or 1036904035, see Table 65: RJ-45 (RS-232 Serial Console Port) and DB9 Adapter Pin Assignments on p. 575)
- A communications program, like TeraTerm Pro Web (a free software terminal emulator for MS-Windows)
- An Internet browser [e.g. Internet Explorer 5.0 or greater (IE 8.0 recommended) or Firefox 2.0 or greater (Firefox 3.6 recommended), etc.] This procedure is intended to be used during the commissioning process or used as a stand-alone procedure.
- An ADVA Optical Networking qualified 3G modem, ZTEMT 119 or HW E1750

This procedure is intended to be used during the commissioning process or used as a stand-alone procedure.

The default DHCP setting for the FSP 150SP DCN port is **disabled** and as a **DHCP client**.

The CLI entries shown in these procedures are for example purposes only. The information you enter should be determined from local sources. At the finish of the procedure, the 3G modem gets into in-service state and connects itself to the local 3G wireless network with the credential provided. Please consult the *FSP 150SP-100 Command Line Interface Reference Guide* for the details of running each command.

Procedure

Step 1 Connect a serial cable between the FSP 150SP RS-232 Serial Port and a PC and logon using procedure: "Serial Connection" on p. 276.

Step 2 Navigated to the 3G Modem Command Level.

```
ADVA--> network-element ne-1
ADVA-NE-1--> configure nte NTESP100-1-1-1
ADVA-NE-1:NTESP100-1-1-1--> configure usb
ADVA-NE-1:3g_dcn-1-1-1-1-->
```

Step 3 Determine the next step.

Desired Operation	Then
Set a wireless connection with a PIN-authentication enabled 3G Modem	Continue with the next step.
Set a wireless connection with a PIN-authentication disabled 3G Modem.	Go to Step 5.
Disable Pin Authentication	Go to Step 14.
Unlock the SIM card	Go to Step 16.
Change the PIN	Go to Step 18.

Step 4 Run `pin-authenticaition` command to get authenticated.

```
ADVA-NE-1:3g_dcn-1-1-1-1--> pin-authentication ****
```

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Step 5 Run `dial-number` command to enter the Wireless Access Number.

```
ADVA-NE-1:3g_dcn-1-1-1-1--> dial-number
(650)2222222
ADVA-NE-1:3g_dcn-1-1-1-1-->
```

Step 6 Run `user-name` command to enter the user name for wireless conneciton.

```
ADVA-NE-1:3g_dcn-1-1-1-1--> user-name "tommy J"
ADVA-NE-1:3g_dcn-1-1-1-1-->
```

Step 7 Run `password` command to enter the password for wireless conneciton.

```
ADVA-NE-1:3g_dcn-1-1-1-1-->password ***********
ADVA-NE-1:3g_dcn-1-1-1-1-->
```

Step 8 Run `admin-state` command to transfer the 3G Modem to in-service state.

```
ADVA-NE-1:3g_dcn-1-1-1-1--> admin-state in-service
ADVA-NE-1:3g_dcn-1-1-1-1-->
```

Step 9 Navigated to the Communication level and ran `show 3g-dcn` command. If the 3G port has obtained an IP address, the wireless connection is ready.

```
ADVA-NE-1:3g_dcn-1-1-1-1--> home
ADVA--> configure communication
ADVA:comms--> configure 3g-dcn
ADVA:comms:3g-dcn--> show 3g-dcn

                MTU : 1500
         IP Address : 172.21.66.94
        Subnet Mask : 255.255.255.255
        Primary DNS : 210.21.196.6
      Secondary DNS : 221.5.88.88
```

Step 10 Connect to the device with the IP address on CLI, SNMP or GUI.

Step 11 Go to Step 3.

Step 12 Run `enable-pin` command to enable pin authentication. once pin authentication is enabled, user has to run `pin-aunthenticaion` to access the 3G Modem.

```
ADVA-NE-1:3g_dcn-1-1-1-1--> admin-state in-service
ADVA-NE-1:3g_dcn-1-1-1-1--> enable-pin ****
```

Step 13 Go to Step 3.

Step 14 Run `diable-pin` command to disable pin authentication. once pin authentication is disabled, the user doesn't have to run `pin-aunthenticaion` to access the 3G Modem.

```
ADVA-NE-1:3g_dcn-1-1-1-1--> admin-state in-service
ADVA-NE-1:3g_dcn-1-1-1-1--> enable-pin ****
```

Step 15 Go to Step 3.

Step 16 Run unlock-pin command to unlock the SIM and set a New PIN. This command must be ran in the cases where the PIN has been mistakenly entered 3 times.

```
ADVA-NE-1:3g_dcn-1-1-1-1--> unlock-pin ******* ****
****
```

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```
ADVA-NE-1:3g_dcn-1-1-1-1-->
```

Step 17 Go to Step 3.

Step 18 Change the PIN

```
ADVA-NE-1:3g_dcn-1-1-1-1--> change-pin **** ****
****
```

End of Procedure

Browser-based IP Connection

This procedure details the steps used to access a web-accessible FSP 150SP (HTTP and/or HTTPS enabled) using a web browser on a PC with connectivity to the DCN or 3G modem the FSP 150SP is connected to.

NOTICE

To ensure a reliable connection to a FSP 150SP over an Ethernet DCN network, the IP address of the FSP 150SP's Management Interface should be configured to a unique address compatible with the network it is to be present on.

Procedure

To make an Ethernet DCN connection to the FSP 150SP, perform the following steps:

Step 1 Ensure that a unique IP address has been configured for the FSP 150SP's Management Interface or 3G modem, See "Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port" on p. 276 or "Set Up the 3G Modem Using the Serial Port" on p. 282.

Step 2 Ensure that a physical Ethernet connection from the DCN PC to the FSP 150SP has been established or the 3G modem is provisioned and operational.

Step 3 Verify the user's PC IP address and netmask match the values provided by the Network Administrator, so that it has access to the network the FSP 150SP is on.

Step 4 Establish a connection to the FSP 150SP Management Interface or 3G modem via an internet browser (Internet Explorer 5.0 or greater

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(IE 8.0 recommended) or Firefox 2.0 or greater (Firefox 3.6 recommended) by performing the following:

a) Open up the appropriate internet browser and enter the following address:

http://xxx.xxx.xxx.xxx

or

https://xxx.xxx.xxx.xxx

where `xxx.xxx.xxx.xxx` is the IP address of the FSP 150SP to be connected to. This will be the IP address that has been assigned to the FSP 150SP during initial IP configuration (if none has been set, the default address is `192.168.0.2)`.

The Web Interface will open and the Login Screen will be displayed.

b) Login with the following details:

- Account name - `root` (or as appropriate, see Provision Secure Access, on Page 4-171).
- Password - `ChgMeNOW` (or as appropriate).

Security details will also be displayed on the screen.

c) Press `Continue`.

The Web Interface **FSP 150SP** Main Menu will be displayed, as described in Chapter 3, *"eVision Web Browser Management Tool" on p. 139*.

Note

Commands from the internet browser are authenticated by a 'per-session cookie' (i.e., a cookie that is not stored permanently). If a login to the Web Interface is not possible, check that the internet browser is configured to accept such cookies.

End of Procedure

Edit DCN (eth0) Configuration

The Management LAN Interface can be configured as a DHCP Server, as a DHCP Client, or have DHCP functionality disabled. If DHCP Client mode is not used, the IP Address and Netmask can be edited. Additionally, RIPv2 functionality can be enabled or disabled. This procedure covers editing the DCN options.

The factory default settings are with the DHCP disabled in the client role with RIPv2 disabled.

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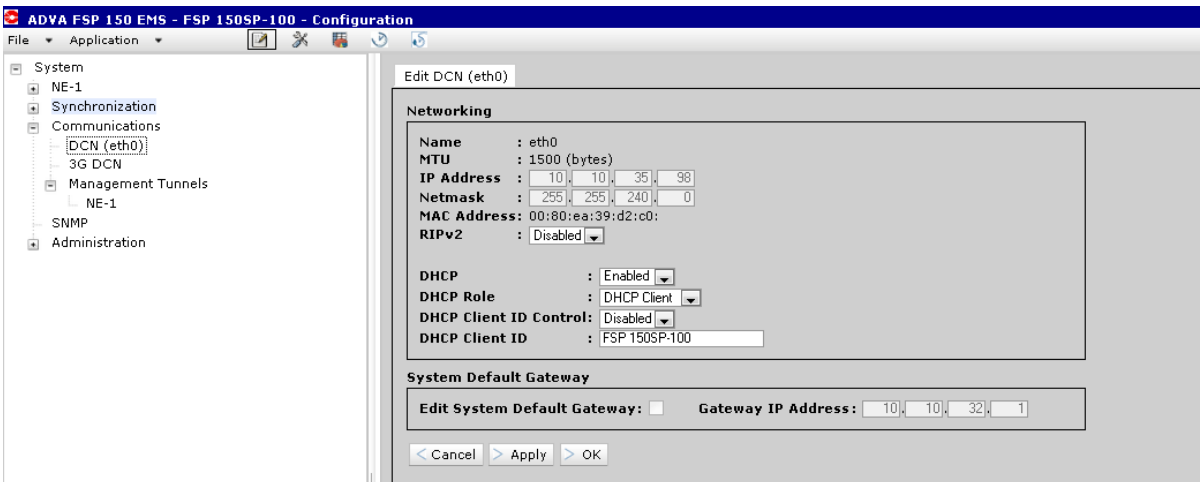
The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN. (See “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

From the Configuration view with the Communications tree expanded:

Procedure

Step 1 Right click on”DCN (eth0)” and select **Edit Configuration.** The following “Edit DCN (eth0)” screen displays.

Figure 167: Edit DCN (eth0)



Step 2 Determine the next step.

Desired Function	Then
Set up DCN as a DHCP Server?	Continue with the next step.
Configure DCN as a DHCP Client?	Go to Step 7.
Disable DHCP functionality?	Go to Step 9.
Configure RIPv2?	Go to Step 11.
Manually Configure IP Address and Netmask?	Go to Step 13.
Provisioning complete?	End of Procedure

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Step 3 Select DHCP - Enabled

Select DHCP Role - DHCP Server

Enter the desired IP Address

Enter the desired Netmask

Note

The range of the Netmask entered determines the number of IP Addresses available for this server to assign.

Select the desired RIPv2 setting

Click on OK

Note

In order for the new IP Address and DHCP server function (IP Address range) to become active, DHCP Control must be cycled.

Step 4 Select DHCP - Disabled

Click on OK

Step 5 Select DHCP - Enabled

Click on OK

Step 6 Go to Step 2

End of Procedure

Step 7 Select DHCP - Enabled

Select DHCP Role - DHCP Client

Enable/Disable DHCP Client ID Control

Edit (if desired) DHCP Client ID (only available if DHCP Client ID Control is Enabled)

Enable/Disable RIPv2 setting

Click on OK

Step 8 Go to Step 2

End of Procedure

Step 9 Select DHCP - Disabled

Enter the desired IP Address, if needed

Enter the desired Netmask, if needed

Select the desired RIPv2 setting

Click on OK

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Step 10 Go to Step 2

End of Procedure

Step 11 Select the desired RIPv2 setting
Click on OK

Step 12 Go to Step 2

End of Procedure

Step 13 Select DHCP - Disabled
Enter the desired IP Address
Enter the desired Netmask
Select the desired RIPv2 setting
Click on OK

Step 14 Go to Step 2

End of Procedure

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Configure Management Tunnel

The FSP 150SP supports the configuration of one VLAN based management tunnel on each Network or Access interface port. The FSP 150SP supports management tunnels that use Ethernet or PPP encapsulation. PPP can only be used with ADVA Optical Networking NIDs that are directly connected and not using Management Traffic Bridging (implements an Ethernet Bridge between the eth0 and all configured Management Tunnels, allowing a single IP address for all management interfaces on the system and eliminates the need for static routes, routing protocols or proxy ARP in an SNE/GNE configuration and supports MAC learning and flooding of un-learned MAC addresses).

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN. (See "Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port" on p. 276) and is logged on using eVision.

From the Configuration view with the Communications and Management Tunnels entities expanded:

Procedure

Step 1 Determine the next step.

Management Traffic Bridging Enabled?	Then
No	Continue with the next step.
Yes	Go to Step 9.

Note

If Management Traffic Bridging is desired, it must first be enabled at the System level. See "Provision System Options" on p. 162.

Step 2 Determine the next step.

Desired Function	Then
Create a management tunnel?	Continue with the next step.
Display a management tunnel?	Go to Step 5.
Edit a management tunnel?	Go to Step 6.
Delete a management tunnel?	Go to Step 8.
Provisioning complete?	End of Procedure.

Step 3 Right click on "NE-1" in the selection tree pane under "Management Tunnels", select Create Tunnel and the following screen displays:

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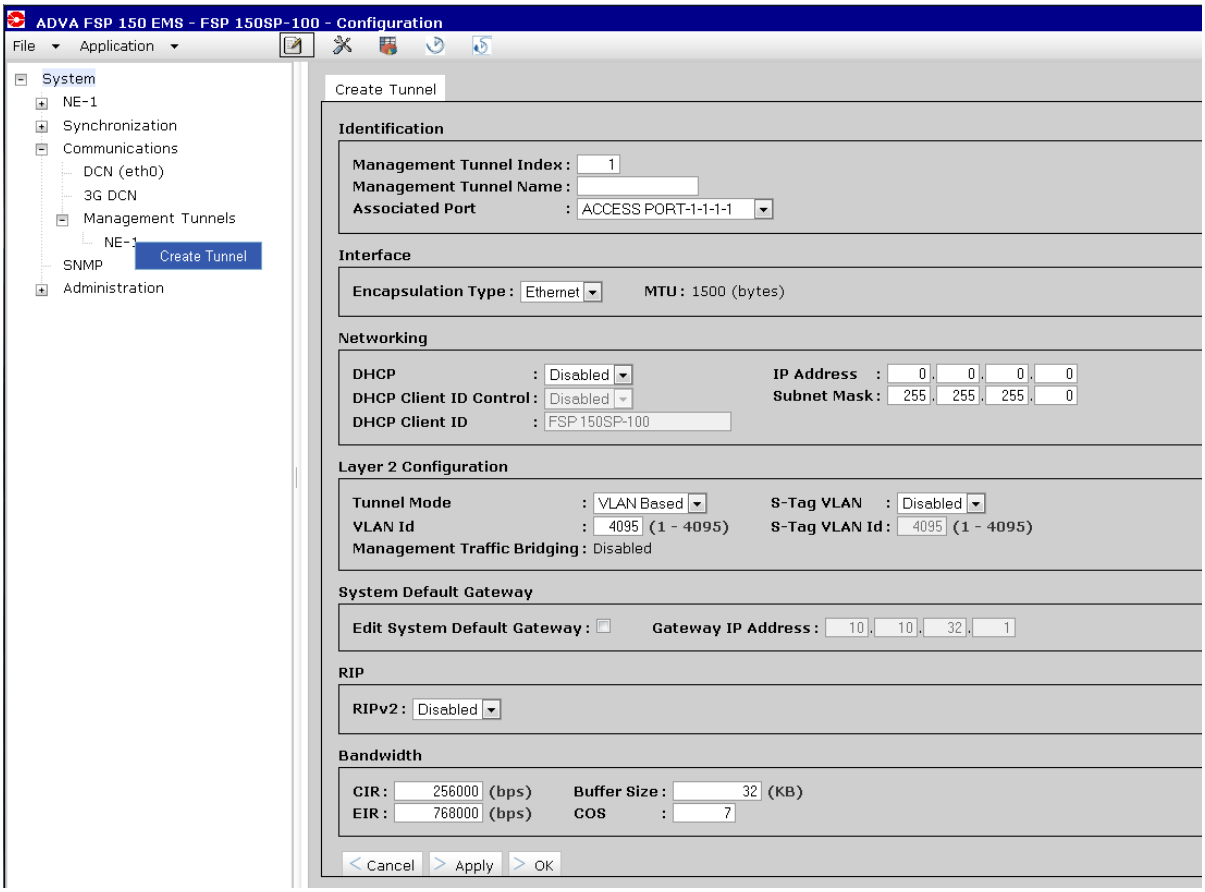
Figure 168: Create Management Tunnel



Step 4 Enter/select the following data to configure the management tunnel:

(see "Management Tunnel Configuration Options and Rules" on p. 521 for details on each item.)

Identification

Management Tunnel Index - integer from 1 to 255

Management Tunnel Name - 1 to 15 alphanumeric characters

Associated Port - select from drop-down list - only one tunnel per port

Interface

Encapsulation Type - Ethernet or PPP

Networking

DHCP - Enabled/Disabled - default is Disabled (not applicable for PPP)

Enable/Disable DHCP Client ID Control (not applicable for PPP)

Edit (if desired) DHCP Client ID (only available if DHCP Client ID Control is Enabled) (not applicable for PPP)

IP Address - valid IPV4 address (not applicable for PPP)

Subnet Mask - valid IPV4 mask (not applicable for PPP)

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Layer 2 Configuration

Tunnel Mode - only VLAN Based supported in this release

VLAN Id - 1 to 4095 - default is 4095

S-Tag VLAN - Enabled/Disabled - default is Disabled

S-Tag VLAN Id - 1 to 4095 - default is 4095 (only applicable if S-Tag VLAN is Enabled)

System Default Gateway

Gateway IP Address is editable if the checkbox is selected (not selectable if DHCP is Enabled)

RIP

RIPv2 - Enabled/Disabled - default is Disabled (not applicable for PPP)

Bandwidth

CIR - 64000 to 8000000 bps - default is 256000 bps (Max of 8 Mbps for all management tunnels combined)

EIR - 0 to 80000000 bps - default is 768000 bps

Buffer Size - 32 to 15000 KB - default is 32 KB

COS - 0 to 7 - default is 7

Click on OK

Step 5 Expand the NE-1 entity under Management Tunnels, left click on the management tunnel ID and verify the data entered. (see figure below)

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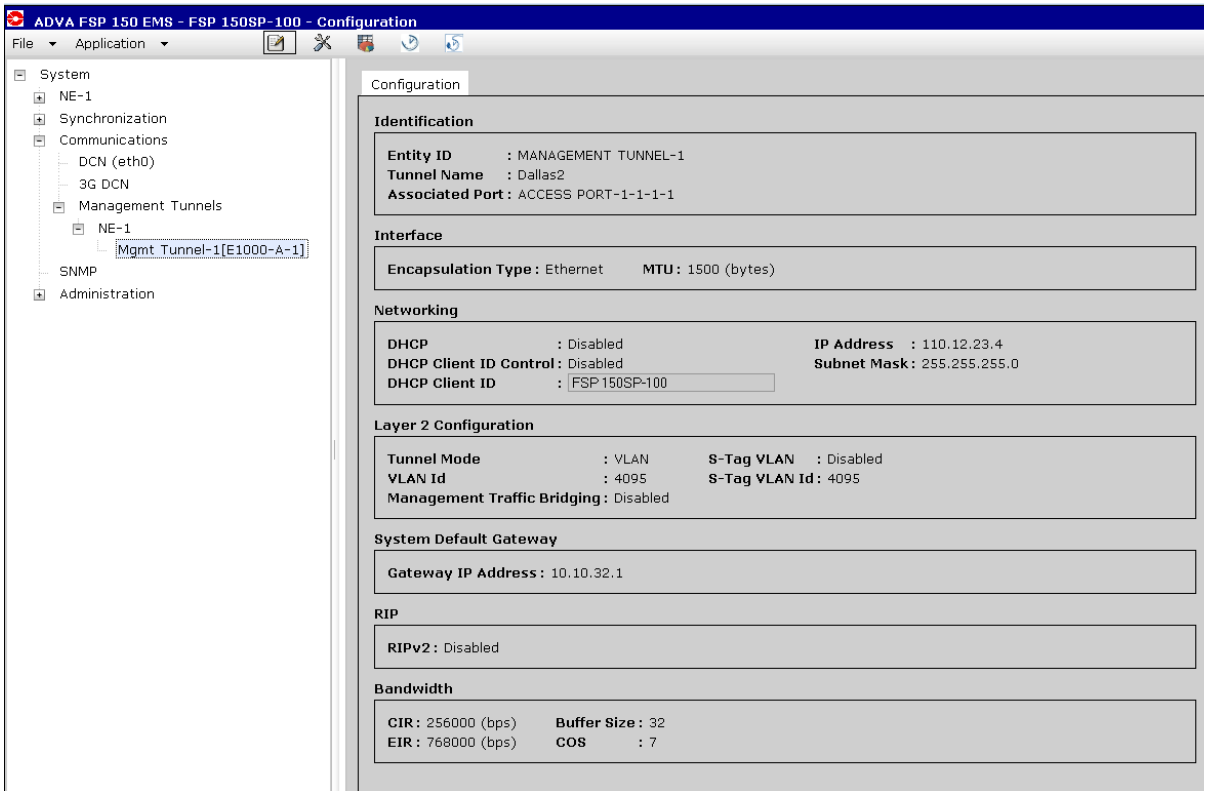
Figure 169: Display Management Tunnel Configuration



Step 6 If anything in the Configuration, RIP or Bandwidth data requires modification, right click on the management tunnel ID and select Edit Configuration (see the following figure):

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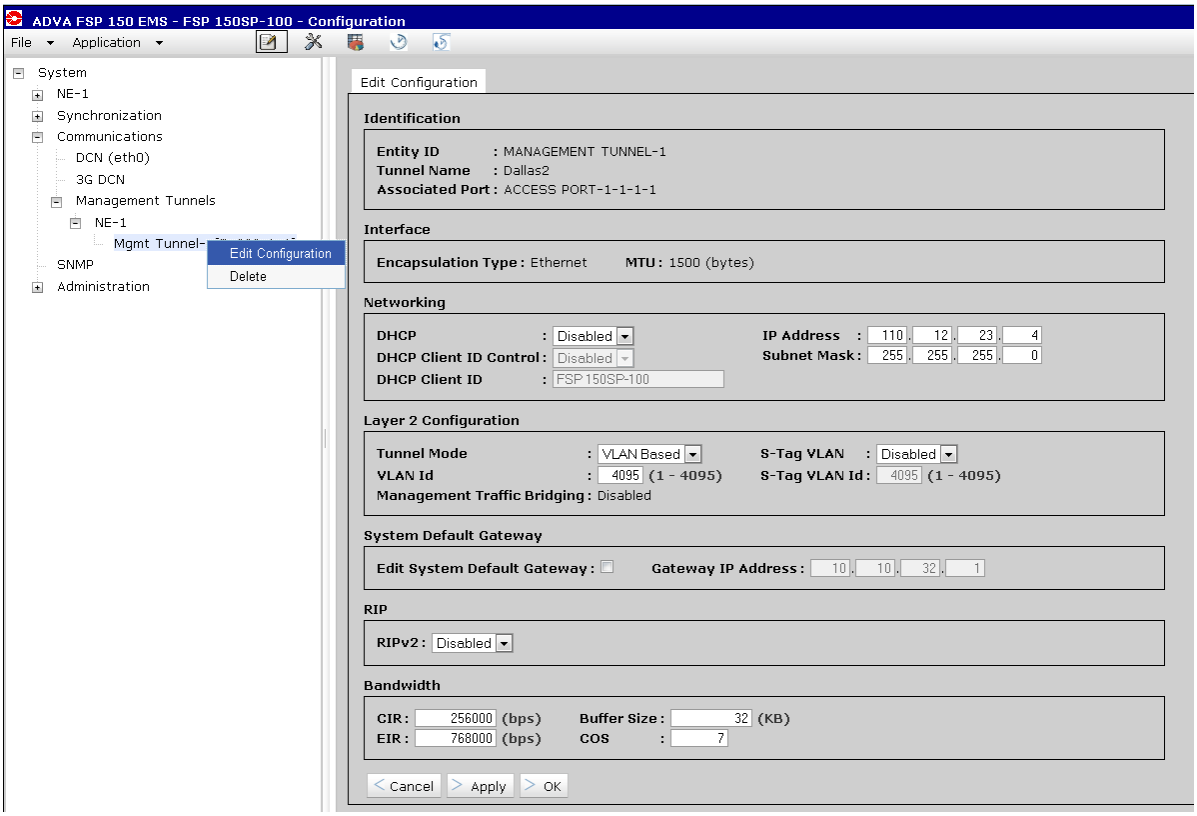
Figure 170: Edit Management Tunnel



Edit the appropriate data.

Click on OK.

Step 7 Go to Step 1.

Step 8 To delete a management tunnel, right click on the management tunnel ID and select Delete (see the following figure).

Click on OK.

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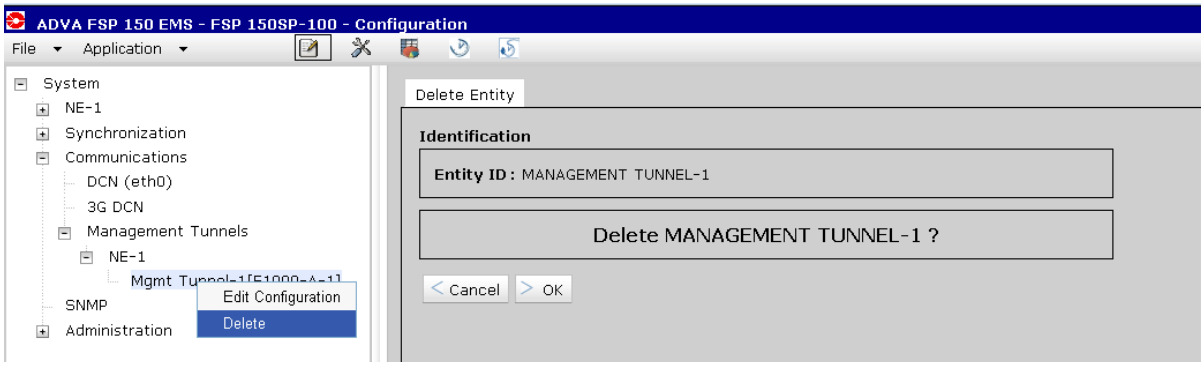
Figure 171: Delete Management Tunnel



End of Procedure

Step 9 Determine the next step.

Desired Function	Then
Create a management tunnel?	Continue with the next step.
Display a management tunnel?	Go to Step 12.
Edit a management tunnel?	Go to Step 13.
Delete a management tunnel?	Go to Step 8.
Provisioning complete?	End of Procedure.

Step 10 Right click on “NE-1” in the selection tree pane under “Management Tunnels”, select Create Tunnel and the following screen displays:

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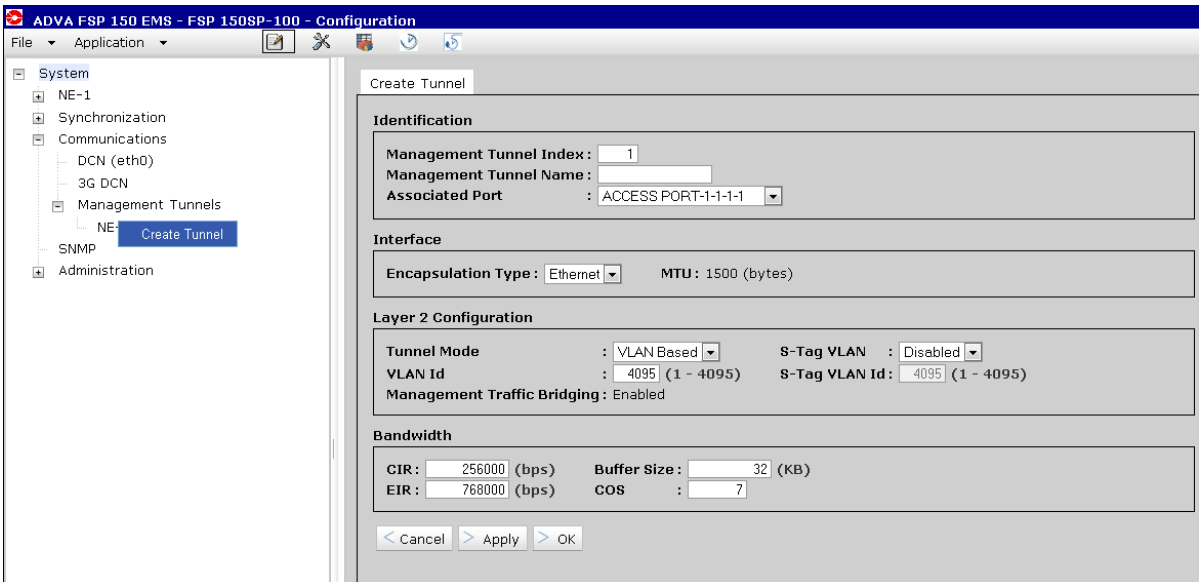
Figure 172: Create Management Tunnel - Bridging Enabled



Step 11 Enter/select the following data to configure the management tunnel:

(see "Management Tunnel Configuration Options and Rules" on p. 521 for details on each item.)

Identification

Management Tunnel Index - integer from 1 to 255

Management Tunnel Name - 1 to 15 alphanumeric characters

Associated Port - select from drop-down list - only one tunnel per port

Interface

Encapsulation Type - Ethernet

Layer 2 Configuration

Tunnel Mode - only VLAN Based supported in this release

VLAN Id - 1 to 4095 - default is 4095

S-Tag VLAN - Enabled/Disabled - default is Disabled

S-Tag VLAN Id - 1 to 4095 - default is 4095 (only applicable if S-Tag VLAN is Enabled)

Bandwidth

CIR - 64000 to 8000000 bps - default is 256000 bps (Max of 8 Mbps for all management tunnels combined)

EIR - 0 to 80000000 bps - default is 768000 bps

Buffer Size - 32 to 15000 KB - default is 32 KB

COS - 0 to 7 - default is 7

Click on OK

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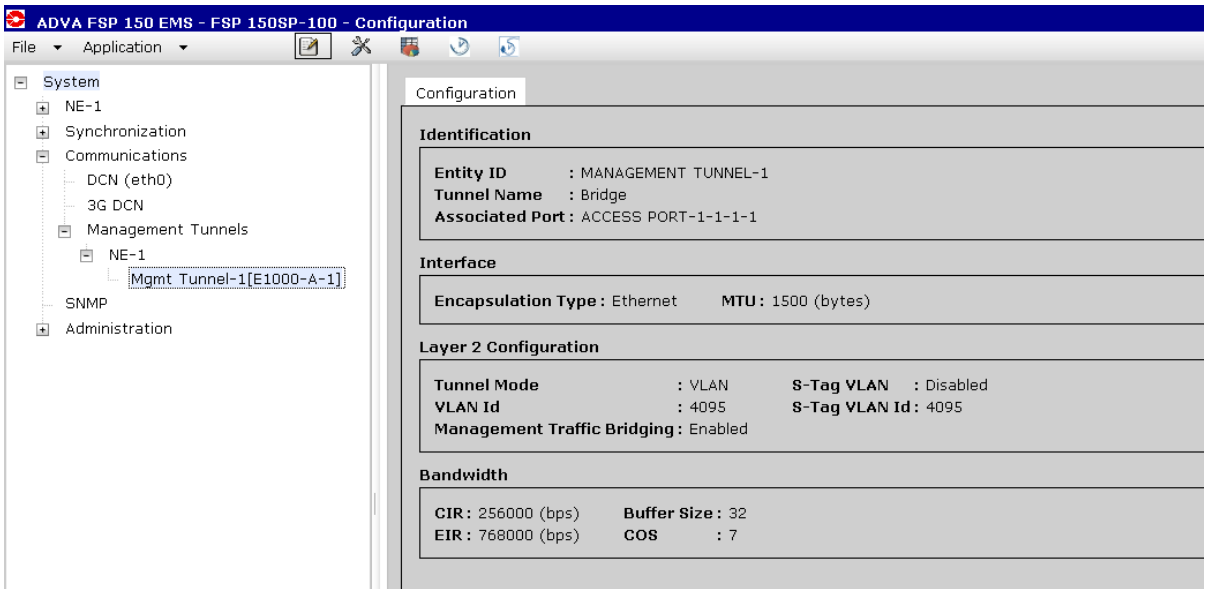
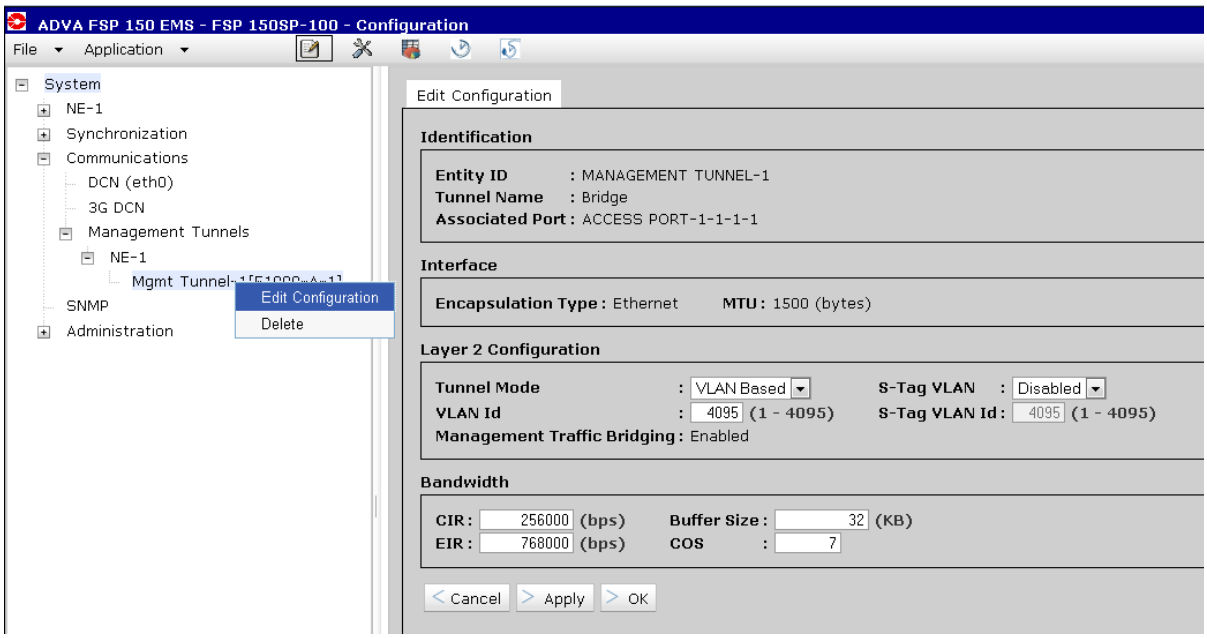
Step 12 Expand the NE-1 entity under Management Tunnels, left click on the management tunnel ID and verify the data entered. (see figure below)

Figure 173: Display Management Tunnel Configuration - Bridging



Step 13 If anything in the Configuration data requires modification, right click on the management tunnel ID and select Edit Configuration (see the following figure):

Figure 174: Edit Management Tunnel - Bridging



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Edit the appropriate data.

Click on OK.

Step 14 Go to Step 1.

End of Procedure

Configure Source Address

The FSP 150SP can have multiple IP addresses assigned when using management tunnels in addition to or in place of the Management LAN interface (System IP Address). When management conditions or messages are sent over another interface, it is often desirable or even necessary that the message be traceable to the Management LAN IP address rather than the address of the interface carrying the message. Setting the Source Address ensures that this address will be used for all management functions for the unit. For details on the settings and options for Source Address, see “Source Address Config (Edit Source Address Config)” on p. 472

The FSP 150SP supports the configuration of one VLAN based management tunnel on each Network or Access interface port.

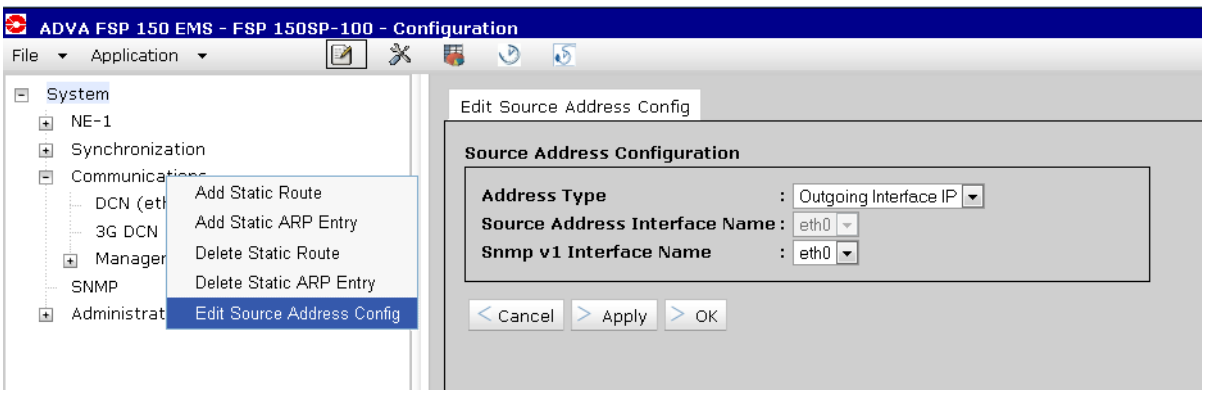
The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN. (See “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

From the Configuration view with the Communications tree expanded:

Procedure

Step 1 Right click on “Communications” in the selection tree pane, select Edit Source Address Config and the following screen displays (see the following figure):

Figure 175: Edit Source Address Config



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Step 2 Enter/select the following data to configure Source Address:

Address Type - Select “System IP Address” or “Outgoing Interface IP”

Source Address Interface Name:

If Address Type is “System IP Address”, select the desired Source Address Interface Name from the drop-down list.

If Address Type is “Outgoing Interface IP”, Source Address Interface Name is fixed as “eth0” (Management LAN)

SNMP v1 Interface Name:

Select the desired interface name from the drop-down list.

Click on OK

End of Procedure

Add/Delete Static Route

Static Routes may be displayed, created or deleted. To edit an existing static route, delete it and add a new static route.

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN. (See “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

From the Configuration view with the Communications tree expanded:

Procedure

Step 1 Determine the next step.

Desired Function	Then
Add a Static Route?	Continue with the next step.
Display Static Routes?	Go to Step 5.
Delete Static Route?	Go to Step 7.
Provisioning complete?	End of Procedure.

Step 2 Right click on “Communications” in the selection tree pane and select Add Static Route and the following screen displays (see the following figure):

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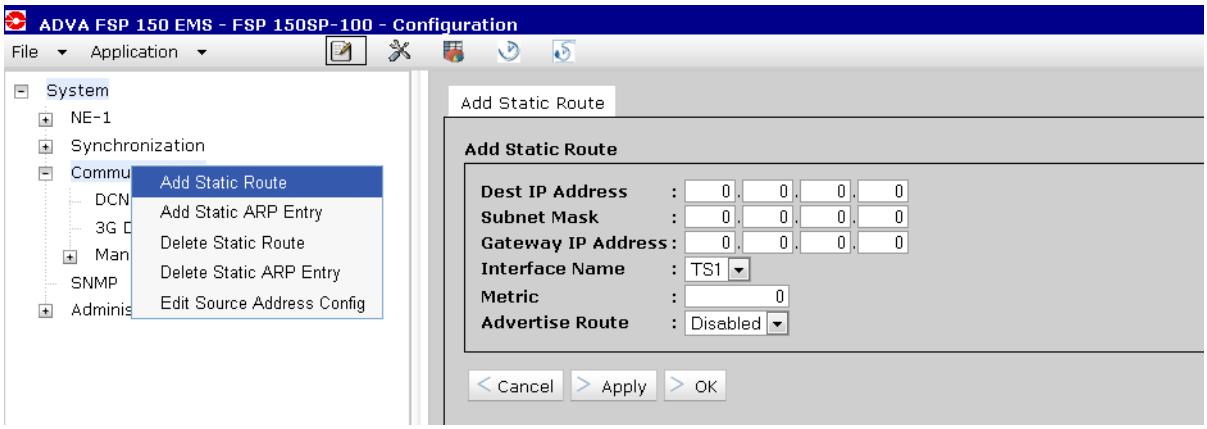
Figure 176: Add Static Route



Step 3 Enter/select the following data to create a static route:

Destination IP Address - valid IPV4 address

Subnet Mask - valid IPV4 mask

Gateway IP Address - valid IPV4 address of Gateway

Interface Name - Select desired Interface Name from the drop-down list.

Metric - 0 to 65535

Advertise Route - select “Disabled or Enabled”

Click on OK

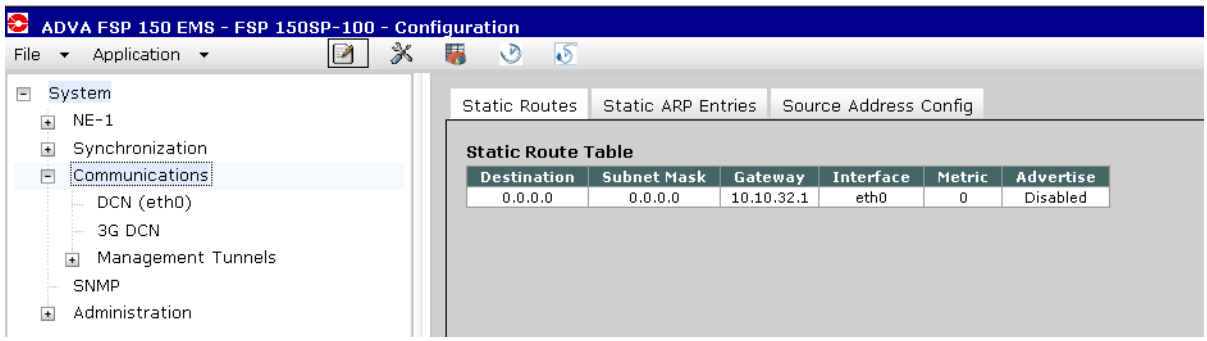
Note

If Management Traffic Bridging is enabled, only eth0 is allowed for Interface Name. To enable Management Traffic Bridging, refer to Table 30: System Configuration Settings on p. 464.

Step 4 Go to Step 1

Step 5 Left click on “Communications” and select the “Static Routes” tab. (see Figure 177 on p. 300)

Figure 177: Display Static Routes



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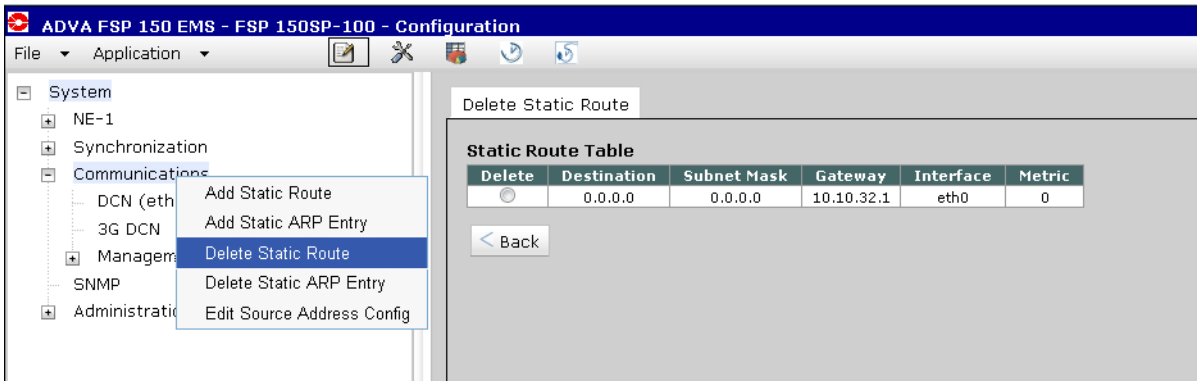
Step 6 Go to Step1

Step 7 To delete a Static Route, right click on Communications and select “Delete Static Route” (see the following figure):

Figure 178: Delete Static Route



Click the radio button in the “Delete” column for each route to be deleted.

Click on OK.

Step 8 Go to Step 1.

End of Procedure

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Add/Delete Static ARP Entry

Static ARP Entries may be displayed, created or deleted. To edit an existing static ARP entry, delete it and add a new static ARP entry.

The following procedure assumes that the user has configured the NE with an IP address and connected the NE to a DCN or LAN. (See “Set Up the FSP 150SP DCN (eth0) Port Using the Serial Port” on p. 276) and is logged on using eVision.

From the Configuration view with the Communications tree expanded:

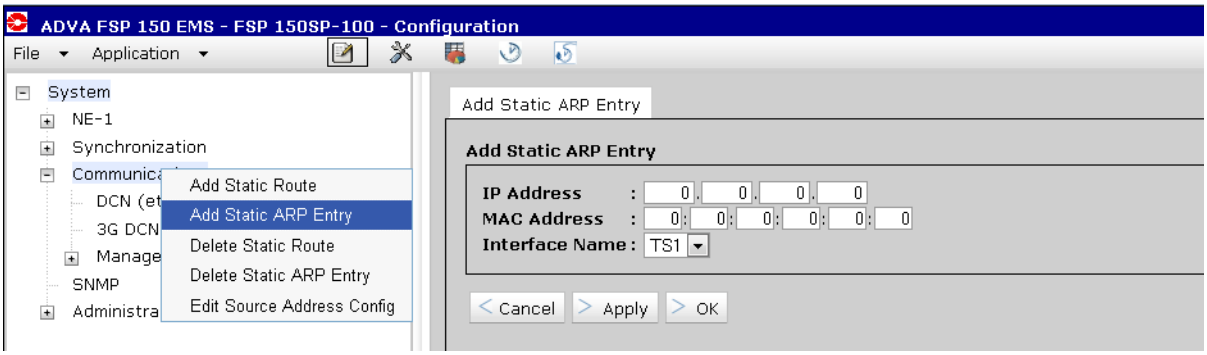
Procedure

Step 1 Determine the next step.

Desired Function	Then
Add a Static ARP Entry?	Continue with the next step.
Display Static ARP Entries?	Go to Step 5.
Delete Static ARP Entry?	Go to Step 7.
Provisioning complete?	End of Procedure.

Step 2 Right click on “Communications” in the selection tree pane and select Add Static Route and the following screen displays (see the following figure):

Figure 179: Add Static ARP Entry



Step 3 Enter/select the following data to create a Static ARP Entry:

IP Address - valid IPV4 address

MAC Address

Interface Name - Select desired Interface Name from the drop-down list.

Click on OK.

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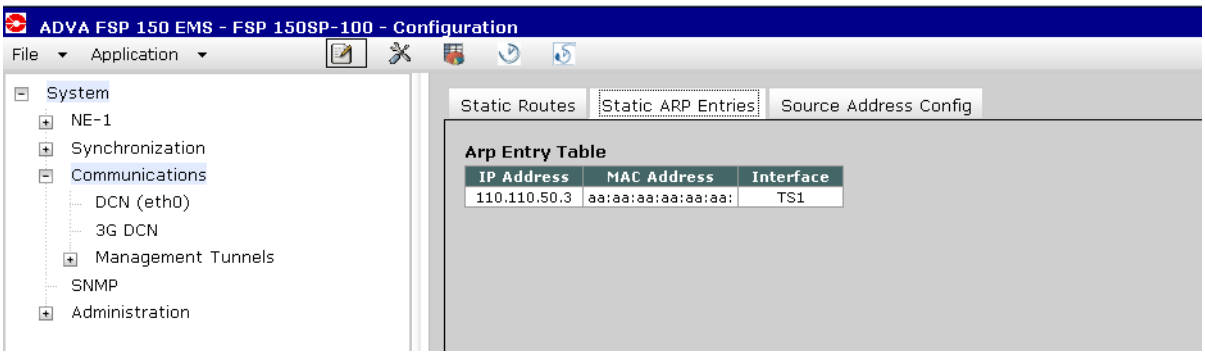
Note

If Management Traffic Bridging is enabled, only eth0 is allowed for Interface Name. To enable Management Traffic Bridging, refer to Table 30: System Configuration Settings on p. 464.

Step 4 Go to Step 1.

Step 5 Left click on “Communications” and select the “Static ARP Entry” tab. (see the following figure)

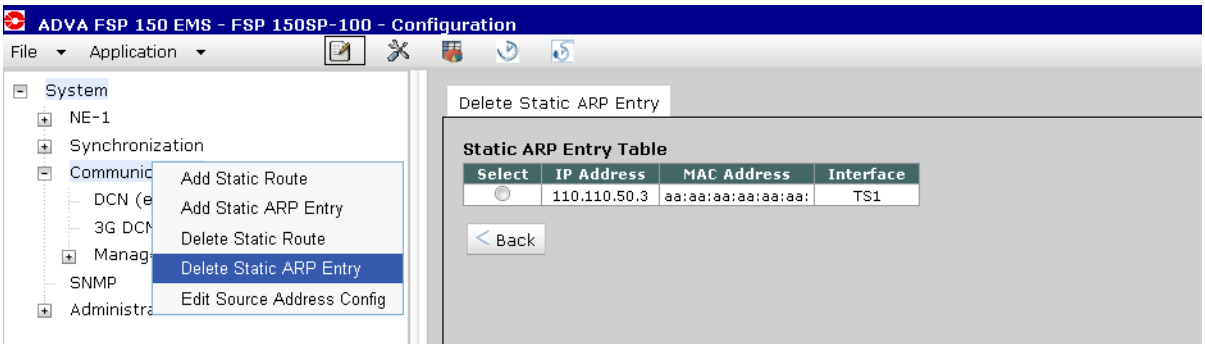
Figure 180: Display Static ARP Entries



Step 6 Go to Step 1.

Step 7 To delete a Static ARP Entry, right click on Communications and select “Delete Static ARP Entry” (see the following figure):

Figure 181: Delete Static ARP Entry



Click the radio button in the “Delete” column for each ARP entry to be deleted.

Click on OK.

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Step 8 Go to Step 1.

End of Procedure

Configure Access Control List (ACL)

See "Configure ACL" on p. 166.

Configure 3G Modem Using eVision

The 3G DCN USB port provides a wireless management port that can be accessed via a 3G network, so that the user can connect to the SP-100 without local DCN cable connections, or it can work as a back-up management port when the DCN LAN port is disconnected or inoperable.

When the primary management connection is in service and working, and SNMP is provisioned, SP-100 reports its public IP address acquired from the 3G service provider to a Network manager via the primary management connection (DCN). If the primary management connection fails, management communications may be made to the SP-100 via a public 3G network.

The following is a procedure for provisioning a 3G modem to enable the wireless connection to an SP-100 using eVision. If there is no DCN connected and only a 3G DCN will be provided for this SP-100, refer to "Set Up the 3G Modem Using the Serial Port" on p. 282 to provision the 3G DCN USB port using CLI commands.

Procedure

Step 1 Select Configuration view. Expand the System Name, NE-1 and NTE11x entities in the Selection Tree.

Step 2 Determine the next step.

Desired Function	Description	Then
Edit 3G modem configuration	Provision or edit 3G Modem Configuration.	Continue with the next step.
Observe current 3G modem configuration and SIM status	Observe current 3G modem configuration and SIM status to determine appropriate action	Go to Step 5.
Enable PIN	Requires entry using a PIN. (Can be applied if PIN/PUK status = Disabled.) When the PIN is Enabled, if the 3G Modem is unplugged or the system reboots, the 3G Modem SIM must be unlocked by entering the PIN.	Go to Step 7.
Disable PIN	Allows access without entering a PIN. (Can be applied if PIN/PUK status = OK.)	Go to Step 10.
Change PIN	Change existing PIN. (Can be applied if PIN/PUK status = OK.)	Go to Step 13.

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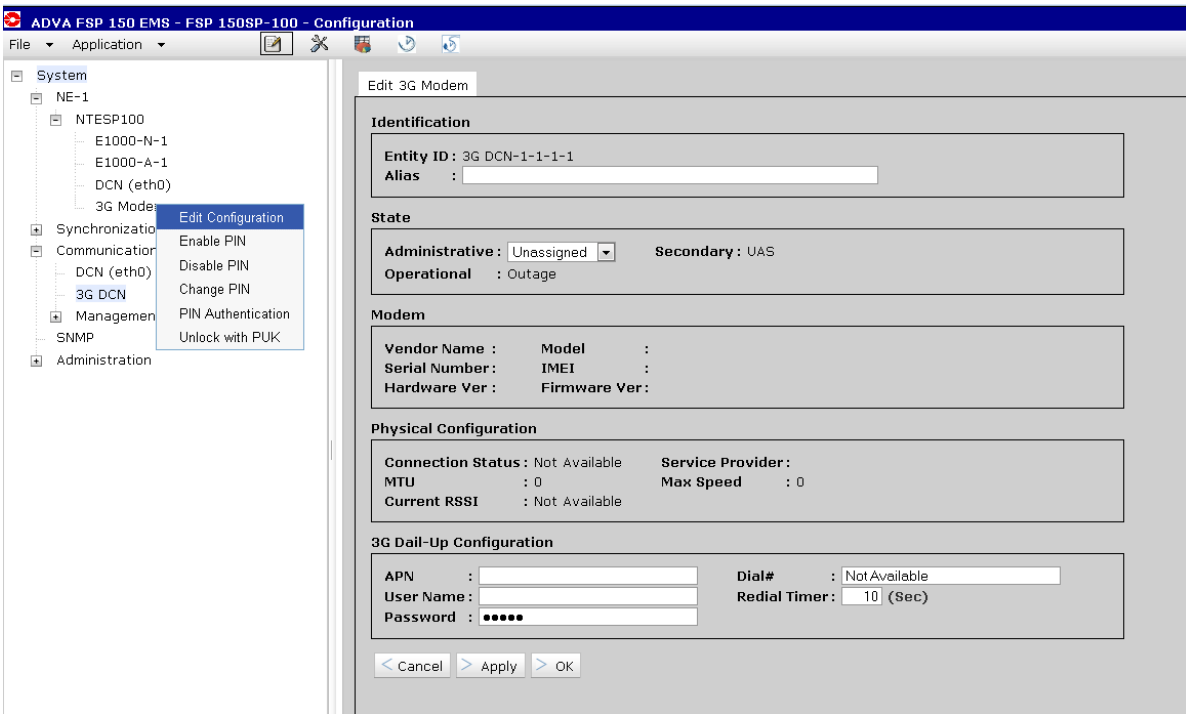
Desired Function	Description	Then
PIN authentication	Enter the PIN. (Can be applied if PIN/PUK status = Input PIN.)	Go to Step 16.
Unlock with PUK	If the PIN input fails for three times during PIN Authentication, the 3G Modem SIM will be locked; therefore, the SIM needs to be unlocked by entering the PUK and new PIN. (Can be applied if PIN/PUK status = Input PUK.)	Go to Step 19.
Observe 3G Network information	Observe the 3G modem network information and IP address	Go to Step 21.
Verify 3G Network Connection	Verify the 3G network connection by logging onto the SP-100 via the IP address acquired from the 3G service provider	Go to Step 23.
Provisioning Complete	All desired provisioning options are completed and current 3G status has been verified	End of Procedure

Step 3 Right click on the 3G Modem entity and select Edit Configuration. The following screen displays.

Figure 182: Edit 3G Modem Configuration



Step 4 Fill in the Alias as appropriate. Select “IS” for Administrative State. The Modem information and Physical Configuration information will display automatically once the 3G modem is plugged in. Enter the 3G Dial-Up Configuration. Click on OK.

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Step 5 Left click on “3G Modem” under NTESP100. Verify the data entered and observe the SIM status by selecting the corresponding tab (see the following two figures). Refer to Table 21 on p. 307 for SIM status result descriptions. The SIM status will be used in the next step.

Figure 183: 3G Modem Configuration Information

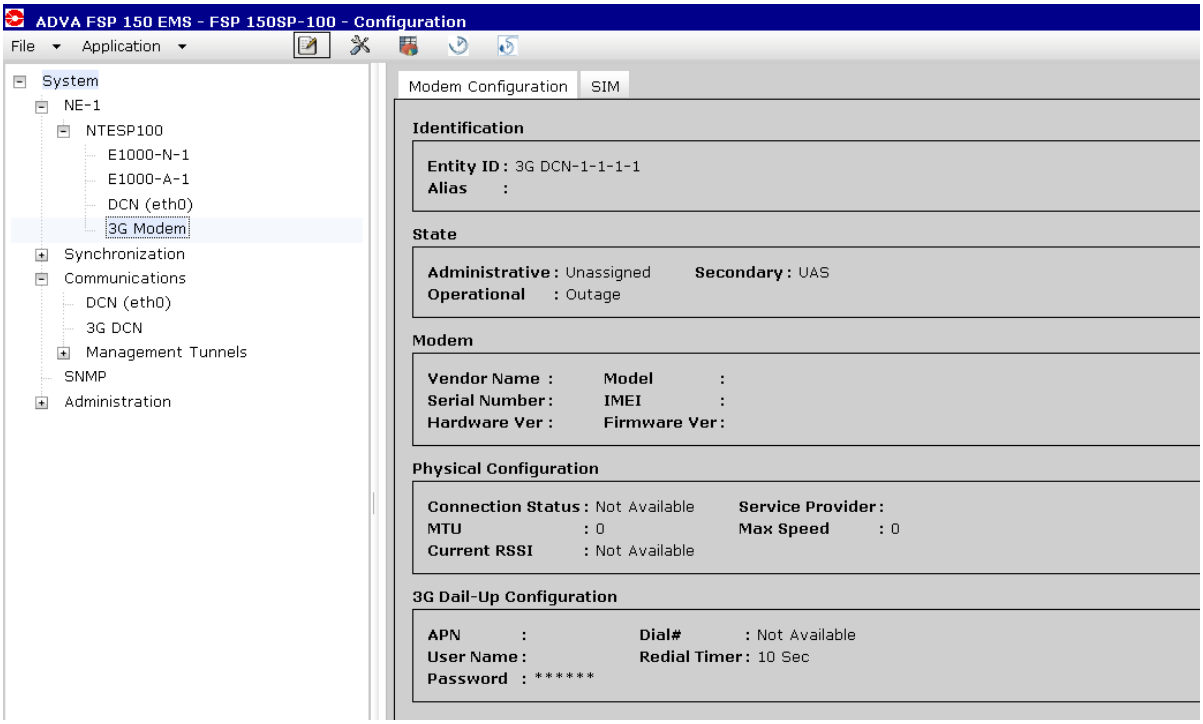

Figure 184: 3G Modem SIM Card Status

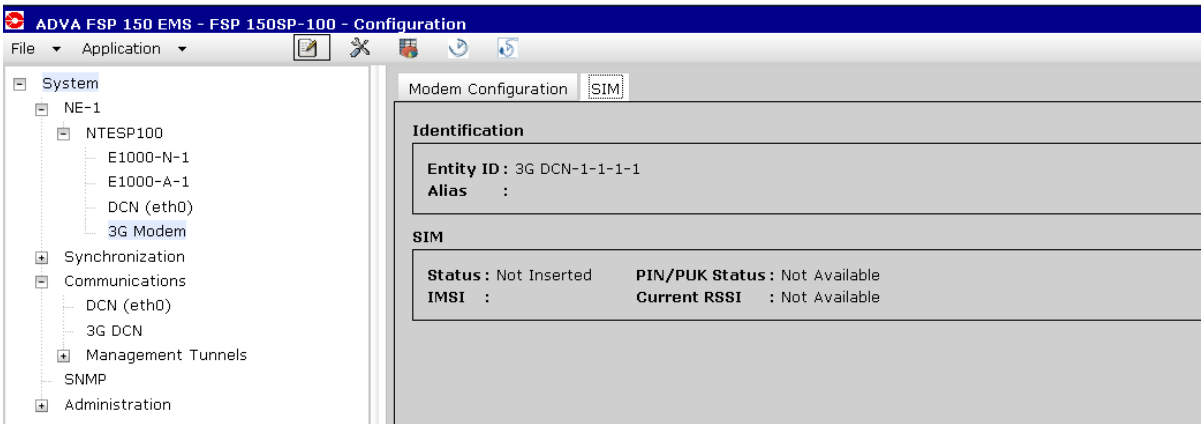

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Table 21: SIM Card Status Description

SIM Status Type	Result	Description
SIM Status	OK	Unlocked status
	Network reject	Invalid SIM
	Not inserted	SIM not inserted
PIN/PUK Status	Disabled	PIN protection is disabled
	OK	PIN protection is enabled and PIN code is correct.
	Input PIN	PIN authentication is required to unlock SIM
	Input PUK	Pin protection is enabled and the PIN code is locked: 3 failed attempts to input PIN has occurred. Unlock with PUK is required.
	Locked	SIM is locked, contact SIM provider
IMSI	IMSI code	International Mobile Subscriber Identity of the SIM card.
	Not Available	SIM is removed
Current RSSI	High, Medium or Low	Current Received Signal Strength Indicator. This value changes automatically according to the actual signal strength.
	Not Available	SIM is removed

Step 6 Use the SIM status information from the previous step to determine the next step.

Desired Function	Then
Enable PIN? (Can be applied if PIN/PUK status = Disabled.) When the PIN is Enabled, if the 3G Modem is unplugged or the system reboots, the 3G Modem SIM must be unlocked by entering the PIN.	Continue with the next step.
Disable PIN? Allows access without entering PIN authentication. Once the PIN is disabled, operations such as Change PIN, PIN Authentication, Unlock with PUK are disabled. (Can be applied if PIN/PUK status = OK.)	Go to Step 10.
PIN authentication required (PIN/PUK status = input PIN)?	Go to Step 16.
Unlock with PUK required (PIN/PUK status = Input PUK)?	Go to Step 19.
Provisioning is complete - Verify 3G Networking Connection?	Go to Step 21.

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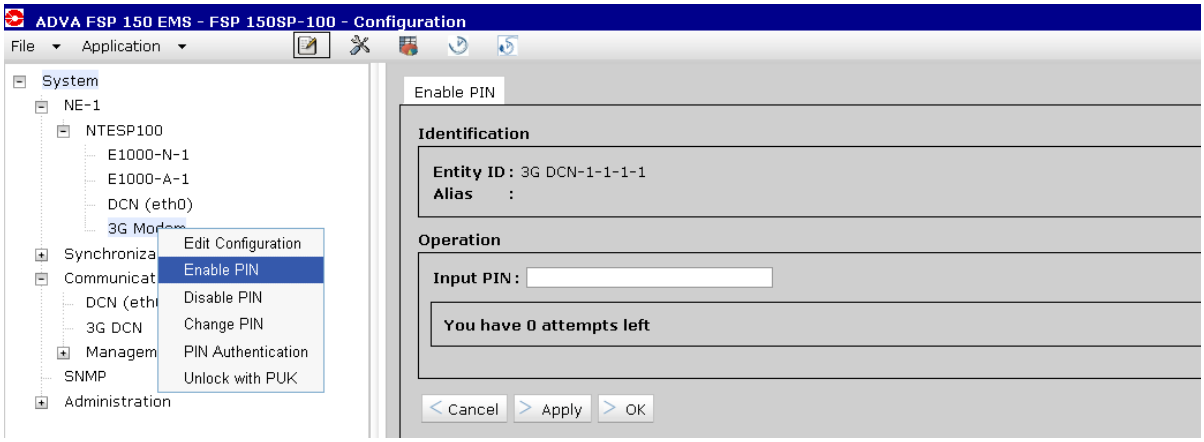
Step 7 To enable 3G Modem PIN, right click on the 3G Modem entity and select “Enable PIN”. The following screen displays.

Figure 185: Enable 3G Modem PIN



Step 8 Enter the PIN provided by wireless ISP. Click OK.

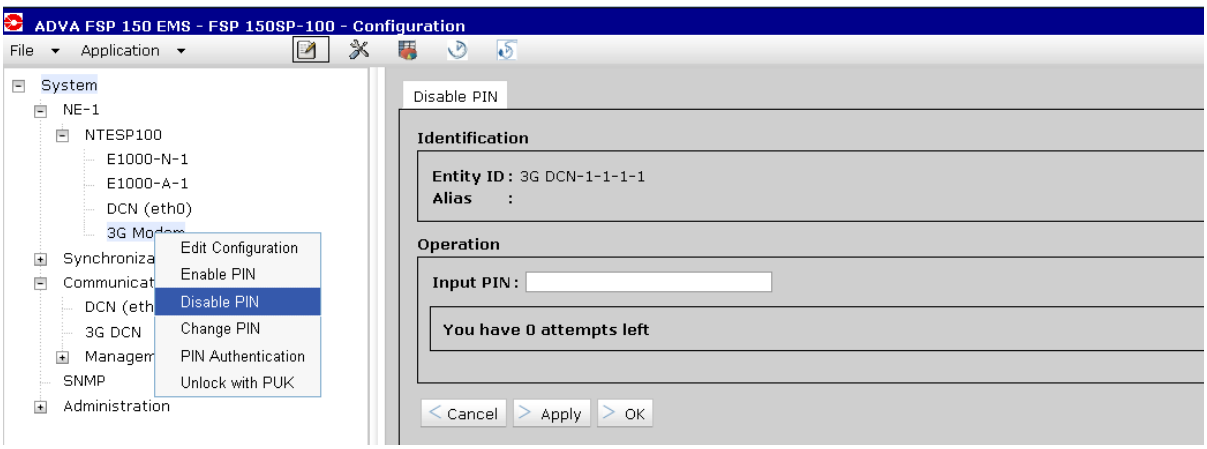
Note

When the PIN is Enabled, if the 3G Modem is unplugged or the system reboots, the 3G Modem SIM must be unlocked by entering the PIN upon each occurrence.

Step 9 Go to Step 5 to observe the current configuration and SIM status to determine the next step.

Step 10 To disable 3G Modem PIN, right click on the 3G Modem entity and select “Disable PIN”. The following screen displays.

Figure 186: Disable 3G Modem PIN



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Step 11 Input PIN and click OK.

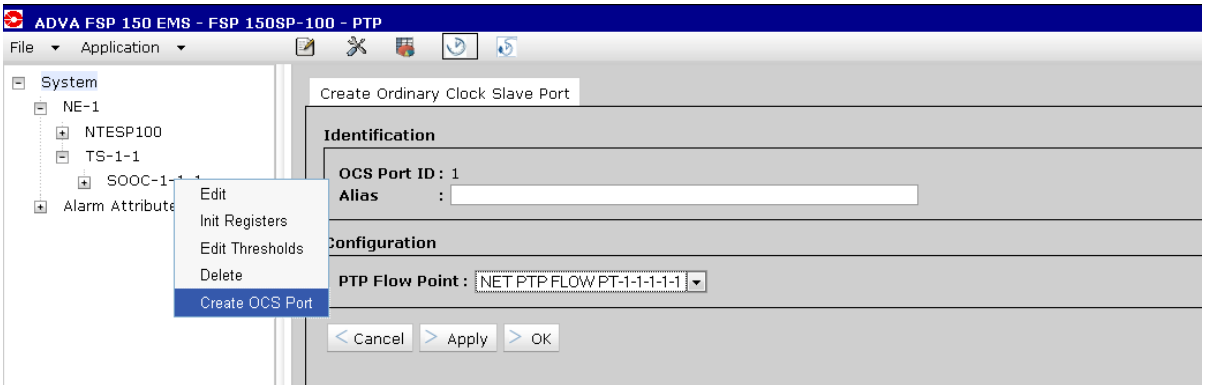
Note

3G Modem SIM will not be locked if the PIN is disabled. Once the PIN is disabled, the operations such as Change PIN, PIN Authentication, Unlock with PUK are disabled.

Step 12 Go to Step 5 to observe the current configuration and SIM status to determine the next step.

Step 13 To change the 3G Modem PIN, right click on the 3G Modem entity and select “Change PIN”. The following screen displays.

Figure 187: Change 3G Modem PIN



Step 14 Enter the current PIN and the new PIN; then repeat the new PIN to confirm the input. Click OK.

Note

The new PIN will take effect in the next time when PIN input is required.

Step 15 Go to Step 5 to observe the current configuration and SIM status to determine the next step.

Step 16 To unlock the SIM by PIN authentication, right click on the 3G Modem entity and select “PIN Authentication”. The following screen displays. Note the number of remaining (failed) attempts indicated.

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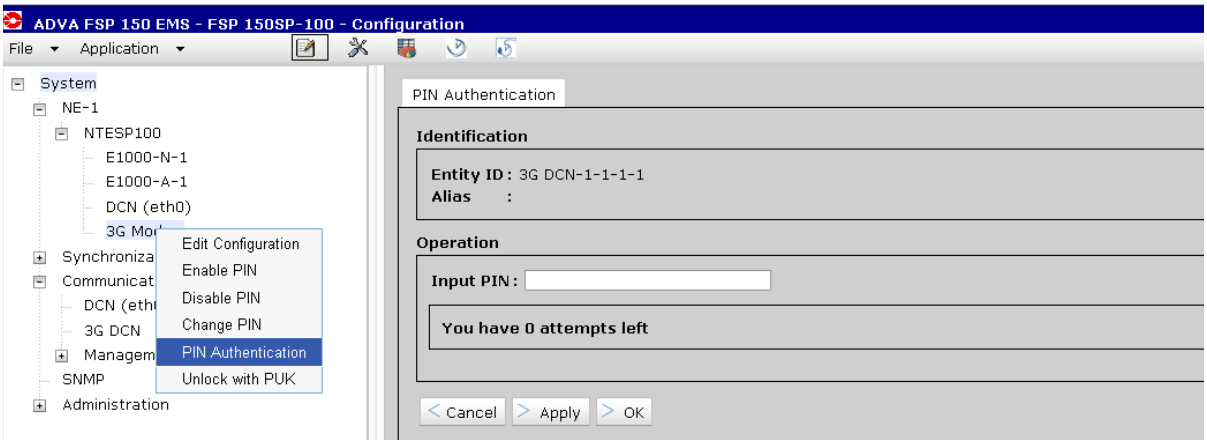
Figure 188: 3G Modem PIN Authentication



Step 17 Input PIN and click OK.

Note

If PIN is Enabled and the 3G Modem is unplugged or the system reboots, the 3G Modem will be locked and the user will need to re-enter PIN authentication. If the PIN input fails after three attempts to authenticate PIN, the 3G Modem SIM will still be locked - and the SIM will need to be unlocked by entering PUK and a new PIN (Step 19).

Step 18 Go to Step 5 to observe the current configuration and SIM status to determine the next step.

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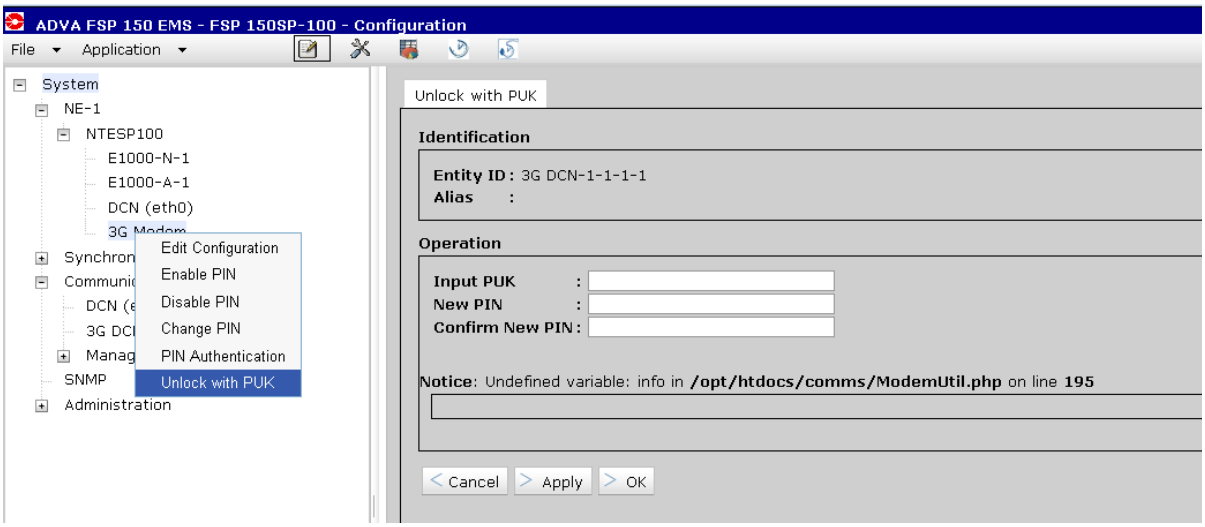
Step 19 If a user fails to unlock the SIM via PIN after three failed attempts, the SIM needs to be unlocked with PUK. Enter a right click on the 3G Modem entity and select “Unlock with PUK”. The following screen displays.

Figure 189: Unlock 3G Modem with PUK



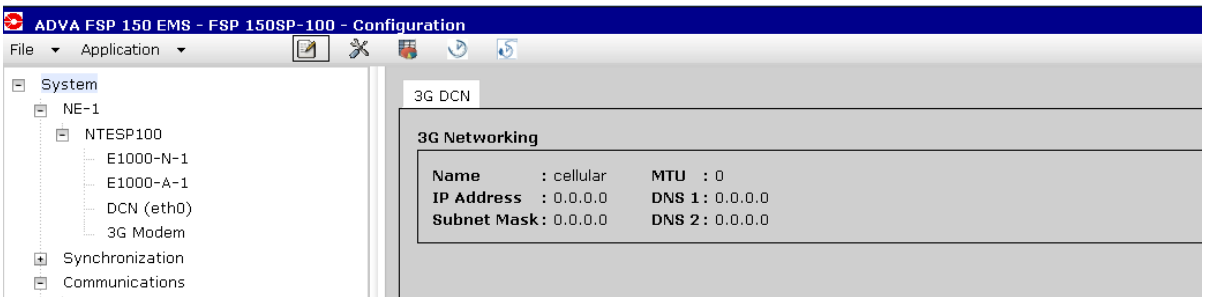
Step 20 Input PUK and the New PIN; then repeat the new PIN to confirm the input. Click OK.

Note

If PUK input fails to unlock SIM after 10 attempts, contact the wireless ISP to unlock the SIM.

Step 21 Observe the 3G Networking information by expanding the Communications entity under System and selecting “3G DCN”.

Figure 190: 3G Networking Information



Step 22 To verify connection to the SP-100 via the 3G networking IP address, continue with the next step. Otherwise, go to Step 5 to observe the current configuration and SIM status to determine the next step.

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Step 23 To verify the connection to the SP-100 via the 3G Networking IP address, open a new web browser window, enter the IP address in the address bar of your Web browser and log onto the SP-100.

End of Procedure

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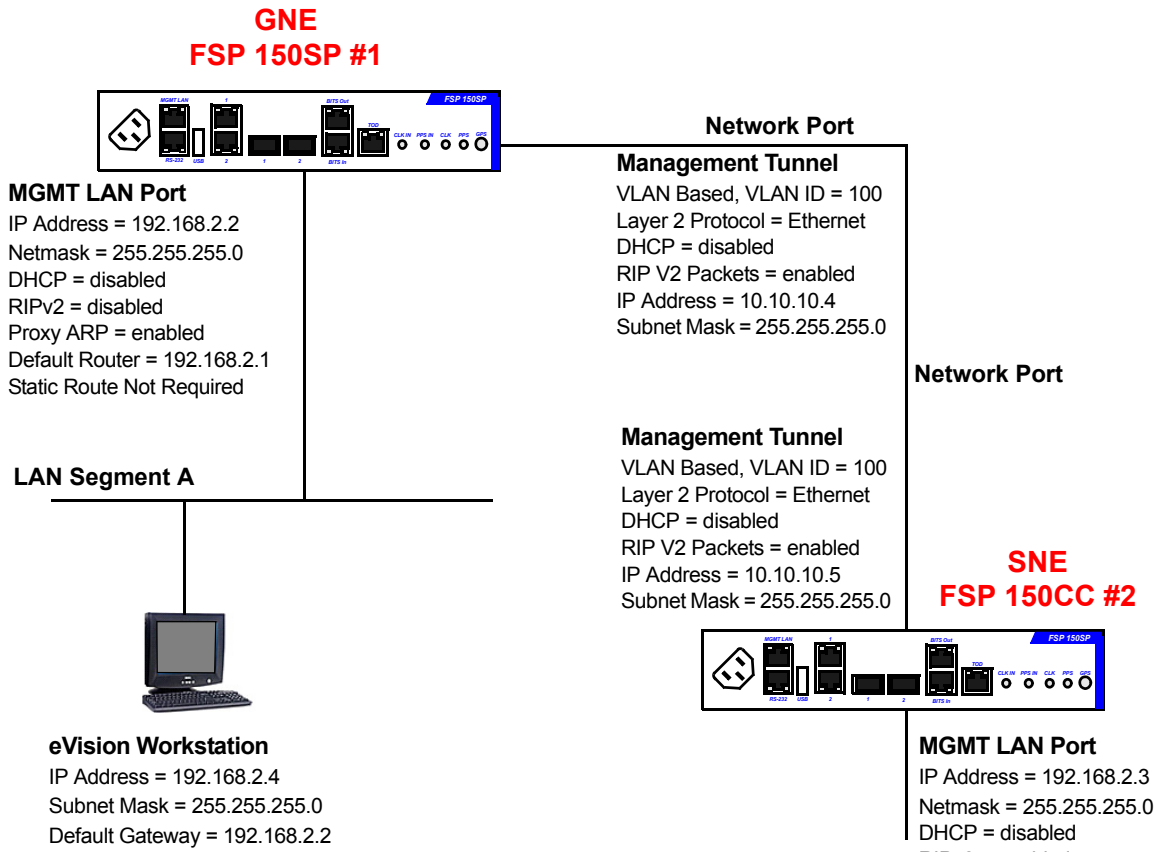
Sample Network - GNE to SNE over Management Tunnel

This is an example of setting up communications between two FSP 150SP's using a management tunnel in a laboratory or back-to-back small network configuration.

The Figure below shows an example of back-to-back FSP 150SPs where the eVision workstation, Gateway NE (GNE) and Subtending NE (SNE) are on the same subnet, and WAN connectivity between FSP 150SPs is via a management tunnel. FSP 150SP #1 and the Workstation reside on LAN Segment A. FSP 150SP #2 has no management LAN connection, and has a WAN management tunnel connection to FSP 150SP #1.

Figure 191: Workstation / GNE / SNE on Same Subnet



Note 1: If a DHCP server is available on LAN Segment A, then enable DHCP on the MGMT LAN Port of FSP 150SP #1. If DHCP is enabled, then the IP Address, Subnet Mask and Default Router are assigned by the DHCP server.

Note 2: User must create a static route on the eVision Workstation PC to reach the SNE **OR** set the PC's Default Gateway to the GNE's IP Address. If there is difficulty logging on to the SNE after initial setup, the ARP cache on the Workstation should be flushed.

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Note

For management tunnels where RIP is enabled, under a Denial of Service attack scenario, RIP PDUs will likely be discarded, resulting in all RIP learned routes being withdrawn from the routing table. On the GNE, this will have the affect of losing the route to the SNE.

Procedure

Perform the following steps at FSP 150CC #2 (SNE):

Step 1 At FSP 150CC #2, perform the procedures "Connect Power Cables and Apply Power" on p. 125 and "Serial Connection" on p. 276.

Note

You should currently be logged onto the FSP 150CC #2's ***RS232 (serial port)*** using CLI.

Step 2 Provision the eth0 (system) IP address using the following CLI command entry

```
ADVA--> configure communication
ADVA:comms--> configure eth0 ip-address 192.168.2.3
255.255.255.0
ADVA:comms-->
```

Step 3 Provision the management tunnel using the following CLI command.

```
ADVA:comms--> add mgmttnl 1 phoenix1 ethernet
vlan-based 100 disabled 10.10.10.5 255.255.255.0
network-1-1-1-1
```

Note

According to the example in Figure 191 on p. 313, the FSP 150CC #2's management tunnel should be set to Ethernet Layer 2 Protocol, VLAN based with the VLAN ID set to 100, DHCP disabled, the IP address should be set to 10.10.10.5 with a Subnet Mask of 255.255.255.0, and RIPv2 should be set to enabled.

Step 4 To edit the management tunnel to enable RIPv2 packets, enter the following CLI command.

```
ADVA:comms--> configure mgmttnl mgmt_tnl-1
ADVA:comms:mgmt_tnl-1--> rip2Pkts-control enabled
```

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Step 5 Set the Management LAN Port's (eth0) admin state to unassigned using the following CLI command.

```
ADVA:comms:mgmt_tnl-1--> home
ADVA--> network-element ne-1
ADVA-NE-1--> configure nte nte114-1-1-1
ADVA-NE-1:NTE114-1-1-1--> configure dcn
ADVA-NE-1:dcn-1-1-1-1--> admin-state unassigned
ADVA-NE-1:dcn-1-1-1-1--> home
```

Step 6 Add a static route to point to the management tunnel on FSP 150SP #1 using the following CLI command

```
ADVA--> configure communication
ADVA:comms--> add ip-route nexthop 0.0.0.0 0.0.0.0
10.10.10.4 phoenix1 1 disabled
```

Step 7 Enter a "show system" and verify that Proxy ARP is disabled. If Proxy ARP is enabled, enter the following command, otherwise continue to the next step

```
ADVA:comms--> home
ADVA--> configure system
ADVA:system--> proxy-arp disabled
```

CAUTION Ensure that the Proxy ARP option is set correctly for the FSP 150SP. If two or more ADVA Optical Networking NEs or FSP 150CCs are connected via SDCC or Management Tunnel as well as connected to the same LAN segment, then **only one** of the them should have the Proxy ARP option enabled. Otherwise, there will be multiple ARP responses for a single ARP request for a remote reachable IP address from each NE/FSP 150CC in the same LAN that has Proxy ARP enabled.

Step 8 Logoff the CLI session and remove any commissioning cables (Ethernet cable and/or console cable) from the FSP 150SP front panel connectors, as required.

Step 9 Connect the optical cables to the FSP 150SP Network Port front panel connectors if they are not already connected.

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Perform the following at FSP 150SP #1 (GNE):

Step 10 At FSP 150SP #1, perform the procedures "Connect Power Cables and Apply Power" on p. 125 and "Serial Connection" on p. 276.

Note

You should currently be logged onto the FSP 150SP #1's ***RS232 (serial port)*** using CLI.

Step 11 Provision a management tunnel using the following CLI command.

```
ADVA--> configure communication
ADVA:comms--> add mgmttnl 1 phoenix1 ethernet
vlan-based 100 disabled 10.10.10.4 255.255.255.0
network-1-1-1-1
```

Note

According to the example in Figure 191 on p. 313, the FSP 150SP #1's management tunnel should be set to Ethernet Layer 2 Protocol, VLAN based with the VLAN ID set to 100, DHCP disabled, the IP address should be set to 10.10.10.4 with a Subnet Mask of 255.255.255.0, and RIPv2 should be set to enabled.

Step 12 Edit the management tunnel to enable RIPv2 packets.

```
ADVA:comms--> configure mgmttnl mgmt_tnl-1
ADVA:comms:mgmt_tnl-1--> rip2Pkts-control enabled
```

Step 13 Provision the eth0 (system) IP address using the following CLI command entry

```
ADVA:comms:mgmt_tnl-1--> home
ADVA--> configure communication
ADVA:comms--> configure eth0 ip-address 192.168.2.2
255.255.255.0
ADVA:comms-->home
```

Step 14 Enable Proxy ARP by entering the following CLI command.

```
.ADVA:comms--> home
ADVA--> configure system
ADVA:system--> proxy-arp enabled
```

CAUTION

Ensure that the Proxy ARP option is set correctly for the FSP 150SP. If two or more ADVA Optical Networking NEs or FSP 150SPs are connected via SDCC or Management Tunnel as well as connected to the same LAN segment, then **only one** of the them should have the Proxy ARP option enabled. Otherwise, there will be multiple ARP responses for a single ARP request for a remote reachable IP address from each NE/FSP 150SP in the same LAN that has Proxy ARP enabled.

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Step 15 Logoff the CLI session and remove any commissioning cables (Ethernet cable and/or console cable) from the FSP 150SP front panel connectors, as required.

Step 16 Ensure the DCN connection for LAN Segment A is connected to the MGMT LAN (eth0) port.

Step 17 Connect the optical cables to the FSP 150SP Network Port front panel connectors if they are not already connected.

Step 18 Observe the Network Port Net and Act LEDs on the front panel. They should be lit green. If the LEDs are not lit green, then troubleshoot the connections between FSP 150SP #1 and FSP 150CC #2.

Step 19 Depending on your configuration, either set the eVision workstation default gateway to point to the GNE FSP 150SP's Management LAN port IP address, or create a static route on the PC to communicate to the SNE (e.g., from Windows command prompt, enter ***route add 192.168.2.3 mask 255.255.255.255 192.168.2.2*** according to the example in Figure 191: , on Page 5-313). This will allow you to connect to the SNE.

Step 20 Verify connectivity to FSP 150SP #1 and FSP 150CC #2 from the eVision Workstation. Open a web browser window [Internet Explorer 5.0 or greater (IE 8.0 recommended) or Firefox 2.0 or greater (Firefox 3.6 recommended)] and enter the IP address of FSP 150SP #1 to access the FSP 150SP eVision Web Browser Management Tool. Logon using a valid user name and password. The default login and password are '**root**' and '**ChgMeNOW**,' respectively. Repeat for FSP 150CC #2.)

End of Procedure

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Chapter 6

Etherjack/Syncjack Test Procedures, and Performance Monitoring

Introduction

This chapter contains information and procedures for the following Etherjack® and Syncjack® testing features.

- Network/Access Port Loopbacks
- Network/Access Port Performance Monitoring
- SyncJack Testing

Network/Access Port Loopbacks

To assist with Ethernet service fault isolation the system supports Port, VLAN and Payload loopback modes on all Ethernet traffic carrying ports (see Note). The loopbacks allow the user to setup an Ethernet test set at a central location to inject traffic into the network.

⚠ WARNING Loopbacks of all varieties except VLAN necessarily result in blocking normal traffic flows and are therefore service affecting.

As shown in the example in following figure, traffic is looped back into the network and back to the test-set. The test-set can look for any anomalies such as frame loss or out-of-sequence frames. The loopback eliminates the need to connect a test-set in the field or at the customer premise to verify round-trip service.

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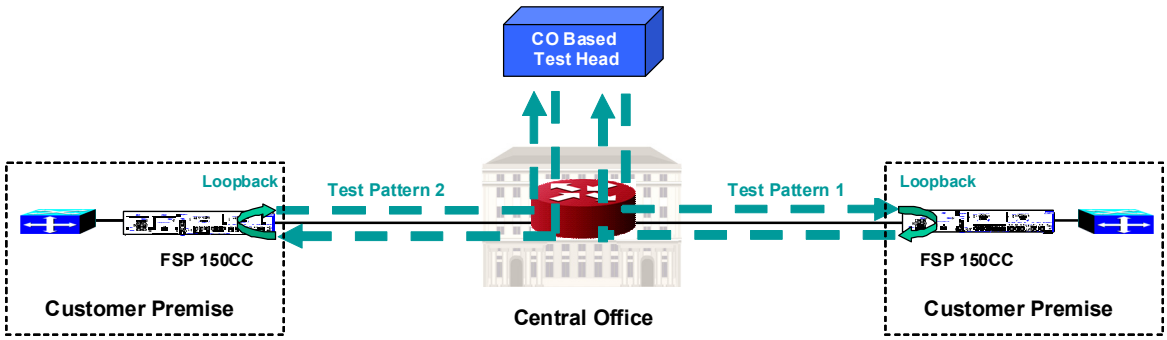
Figure 192: CO Based Testing Using Ethernet Loopback



The following loopback functions are available:

- Facility Port
- Facility Port Timed

Performing Loopbacks Using eVision

From the Maintenance application, entering a right click on a Network Port or Access Port and selecting **Loopbacks** provides a Loopback view. From this view, the Network Port or Access Port can be placed in the Maintenance state, and a loopback can be performed.

Port loopbacks ignore traffic shaping, allowing use of the full port bandwidth.

Selecting the Swap SADA [Swapping the Source Address (SA) with the Destination Address (DA)] option during the loopback directs the FSP 150SP to look up the MAC address of frames being received and swap out the Source Address with the Destination Address, allowing the Layer 2 cloud to forward the frames.

Only one Swap SADA loopback may be performed per system. Once Swap SADA loopback has been operated, a second Swap SADA loopback may not be performed on another entity.

If Facility Port Timed is selected, the Timer is set by the user for 1 to 300 seconds (the duration of the loopback).

See the following figure for an example of a loopback view. For a description of the eVision web browser management tool functions, see Chapter 3, “eVision Web Browser Management Tool” on p. 125. For a list of loopback setting options, rules, and associated default settings, see “Performance Monitoring Settings” on p. 478.

To remove a loopback, click on the drop-down list for Loopback Configuration and select “None”, then click on “OK”.

For more information regarding loopback operation overview, see “Port Loopback” on p. 56.

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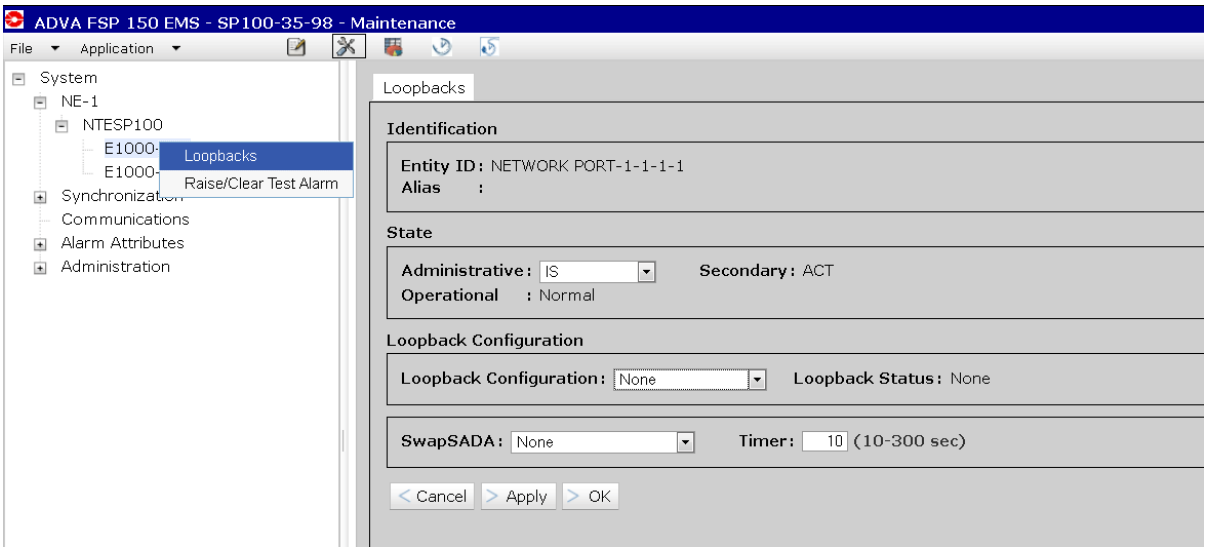
Figure 193: Loopback View



Network/Access Port Performance Monitoring

Overview

The Performance Monitoring (PM) feature enables in-service, non-intrusive system monitoring to aid in diagnosing and isolating issues that may occur during operation. PM enables users to detect and react to potential failures prior to a customer outage. In addition to providing traditional SNMP MIB Etherstats, Syncjack® provides Performance Parameters (PPs) and features similar to those found in traditional services. This allows Ethernet service assurance to be integrated into a carrier's existing service assurance infrastructure.

Performance Monitoring view allows you to view performance monitoring counts and view PM thresholds. Performance monitoring thresholds can be edited, and registers can be initialized (for users with proper user access permission level).

This chapter contains the following step by step procedures:

- "Configuring System Level PM" on p. 325
- "Initializing PM Registers" on p. 331
- "Editing PM Thresholds" on p. 332

For PM commands using CLI, refer to the *FSP 150SP-100 Command Line Reference Guide.*

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PM Features

The following features are provided:

- retrievable performance data for each managed entity, so the user can determine past and current system operation. PM data collection is performed via a polling mechanism, were primitives are gathered into accumulated counts. After a defined interval, (e.g., 15 minutes or 1 day), the counts are binned and stored in a database.
- the checking of PM counts against a threshold to see if the threshold has been crossed. If so, a Threshold Crossing Alert (TCA) is reported, so that corrective actions can be taken.

PM supports:

- threshold setting and automatic TCA message generation
- Current and History PM bins provide a continuous record of service performance, allowing for accurate SLA conformance statements.

PM counts can be displayed as a summary or in tabular format in the eVision web browser management tool, can be filtered and/or refreshed and allows exporting data as Excel spreadsheets.

Performance Parameters

There are several categories of Performance Parameters (PPs) that are collected, as follows:

- equipment presence and type [e.g., Small Form Factor Pluggable (SFP) Interface type and presence, module type and presence]
- physical Layer monitoring (e.g., optical power, temperature)
- Ethernet Statistics (e.g., the number of Ethernet packets received/transmitted)
- Protocol Statistics (e.g., the number of protocol dependent packets received/transmitted)

The following entities are monitored for performance data which is accumulated into PPs:

- Ethernet Network ports
- Ethernet Access ports
- Telecom Slave (TS)
- Slave Only Ordinary Clock (SOOC)
- ocsFP (FlowPoint)
- PTP Network Probe

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Performance Parameter Attributes

Each PP can be defined by the attributes outlined in the following table.

Table 22: Performance Parameter Attributes

Attribute	Description
Monitor Type	The name of the PP. This will be presented in mnemonic form (e.g. ESF (EtherStat Frames).
Location	Whether the PP is a Near-End or Far-End parameter. The location is determined in relation to the monitored entity, in that the PP has occurred: • Locally to the entity (or at the near end). • Remotely to the entity (or at the far end).
Direction	Whether the PP is a Receive or Transmit parameter. The direction is in relation to the monitored entity.
Time Period	The time period associated with the PP. i.e., 15-Minute, 1-Day or Rollover.
Monitor Timestamp	The time at which the PP was collected: • The current time is used for Rollover and Current counters. • The boundary crossing time is used for History counters (stored as number of seconds since the Epoch).
History Index	Indicates a bin from the historical list of bins: • For 5 minute or 15 Minute history bins, this number is 1 to 32 (1 being the most recent). • For 1 Day history bins, this number is 1. • For current and Rollover bins, this number is 0.

Performance Parameter Counters

Each PP is grouped together for a monitored entity and accumulated into:

- Bins, associated with a predefined time period (i.e., 5-minutes, 15-Minutes or 1-Day) or
- Rollover Counters, for Ethernet managed entities only

The user can reset any individual or all PP counters to zero.

Bins and Bin Periods

The following performance bin periods will exist:

- 1 x Current 15-Minute or 5-Minute Bin
- 1 x Current 1-Day (24-Hour) Bin
- 32 x Historical 15-Minute or 5-Minute Bins

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- 1 x Historical 1-Day (24-Hour) Bin

Note

(1) The 32 Historical 15-Minute Bins provide the most recent 8 hours of performance data.
(2) The Historical 1-Day Bin provides the performance data from the previous day starting from 12:00am (i.e., midnight, 00:00).

Rollover Counter

For Ethernet managed entities only, a Rollover Counter is provided. This gives the current performance data since monitoring began. The counter accumulates until it reaches its maximum size (64 bits). When this happens the counter will 'roll over' to zero and begin again.

Unlike Bins, the Rollover Counter is not related to the time of day, but to system uptime.

Performance Parameter Thresholding

Each PP has a threshold for each bin period which is configurable for each entity instance. The PP count is compared to the configured threshold and if met or exceeded, a Threshold Crossing Alert (TCA) is generated.

Note

Provisioning a threshold to zero will disable threshold monitoring for that entity.

Each Network Port, Access Port and Flow entity type has default thresholds for its PPs, which are used when an entity is provisioned. The default thresholds are configurable.

A TCA is only reported once during a bins time period unless it is initialized and then is crossed again.

Optical Performance Parameter Thresholding

Some optical PPs have a unique thresholding mechanism.

For the PPs Optical Power Transmit (OPT) and Optical Power Receive (OPR), a TCA is raised if the PP count varies by a fixed amount from the provisioned threshold (higher or lower). The target value and the acceptable variance is configurable by the user.

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Threshold Crossing Alert Messages

When a PP threshold has been met or exceeded, a TCA is generated. The following table outlines the attributes that are specified in the TCA message.

Table 23: Threshold Crossing Alert Attributes

Attribute	Description	Values
Entity Identifier	The monitored entity's id	Variable.
Monitor Type	The name of the PP that has crossed its threshold. This will be presented in mnemonic form (e.g. ESF (EtherStat Frames).	See "Monitored Types and Default TCA Settings" on p. 325 for Monitor Type mnemonics.
Time Period	In which time period the threshold was crossed.	15-Minute or 5-Minute 1-Day
Time	The time the threshold was crossed.	Timestamp
Location	The location of the TCA generation. This is determined in relation to the monitored entity, in that the PP has occurred: • Locally to the entity (or at the near end) • Remotely to the entity (or at the far end).	Near end Far end None
Direction	The direction in relation to the monitored entity.	Receive Transmit
Monitored Value	The value of the PP count when the threshold was crossed.	Up to a 64-bit number
Threshold Value	The configured threshold at the time the threshold was crossed.	Up to a 64-bit number

Monitored Types and Default TCA Settings

Refer to "Performance Monitoring Settings" on p. 478 for monitored types and default Threshold Crossing Alert (TCA) settings.

Configuring System Level PM

FSP 150SP-100 allows the user to configure the bin period for Performance Monitoring at system level.

Procedure

Step 1 Select the Performance Monitoring icon or select Performance Monitoring from the Applications menu.

Step 2 Enter a right click on the NE-1 entity in the selection tree and select **Edit**.

An Edit PM Configuration screen is displayed (See Figure 194 on p. 326).

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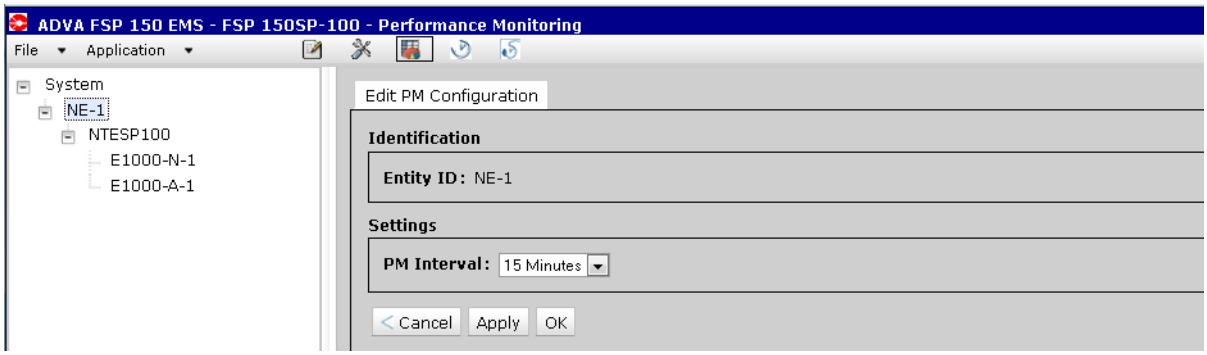
Step 3 Select the desired PM period and click on OK.

End of Procedure

Figure 194: System PM Configuration



Viewing PM Counts and Threshold Values

By selecting a Network or Access Port in the Selection Tree Pane, the following tabs are provided in the Details Pane for each port:

- Summary, which displays a summary of both transmit and receive statistics. See Figure 195 on p. 327 for an example view of a Network Port summary.
- 15 Minute (or 5 Minute), which displays the PM counts in the current 15 Minute (or 5 Minute) performance bin. See Figure 196 on p. 328 for an example view of a Network Port 15 Minute PM counters. If the History checkbox is selected the previous 32 periods are also displayed.
- 1 Day, which displays the PM counts in the current 1 Day performance bin. If the History checkbox is selected the previous period is also displayed.
- Thresholds, which displays the details and the thresholds that have been set for each PP. See Figure 197 on p. 328 for an example view of a Network Port Threshold values.

Procedure

Step 1 Select the Performance Monitoring icon or select Performance Monitoring from the Applications menu, then expand the System selection tree.

Step 2 Expand the Network Element entity from the selection tree, then expand the Network Termination Equipment (NTE) entity. To view Flow PM counts, also expand the Access entity in the selection tree.

Step 3 Select the desired Network Port or Access Port in the selection tree.

The PM Counts pane appears (see Figure 196 on p. 328)

Step 4 Select the desired tab to view Summary, 15 Minute (or 5 Minute) counters, 1 Day counters or Threshold levels. Use sliding bars to view

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data, as required. An asterisk in the Time column indicates data that is suspect. (See Figure 196 on p. 328 and Figure 197 on p. 328)

Step 5 If desired, 15 Minute (or 5 Minute) and 1 Day counts can be exported to an Excel spreadsheet by selecting the Excel button.

An export file pane appears (see Figure 198 on p. 329).

Step 6 Choose the desired application to open, or select the Save to Disk option. The filename dispexecel.php will be created in the selected application (Excel is the default application - see Figure 199 on p. 330). Edit or save the exported file as desired.

End of Procedure

Figure 195: Summary PM Counts View of a Network Port

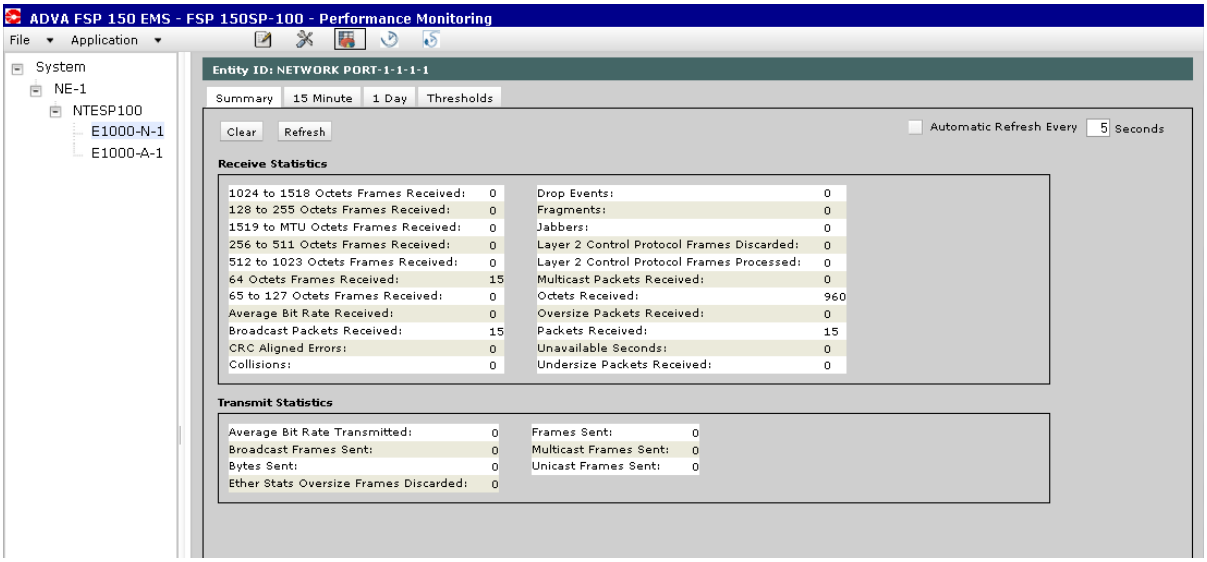

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Figure 196: 15 Minute PM Counts View of a Network Port

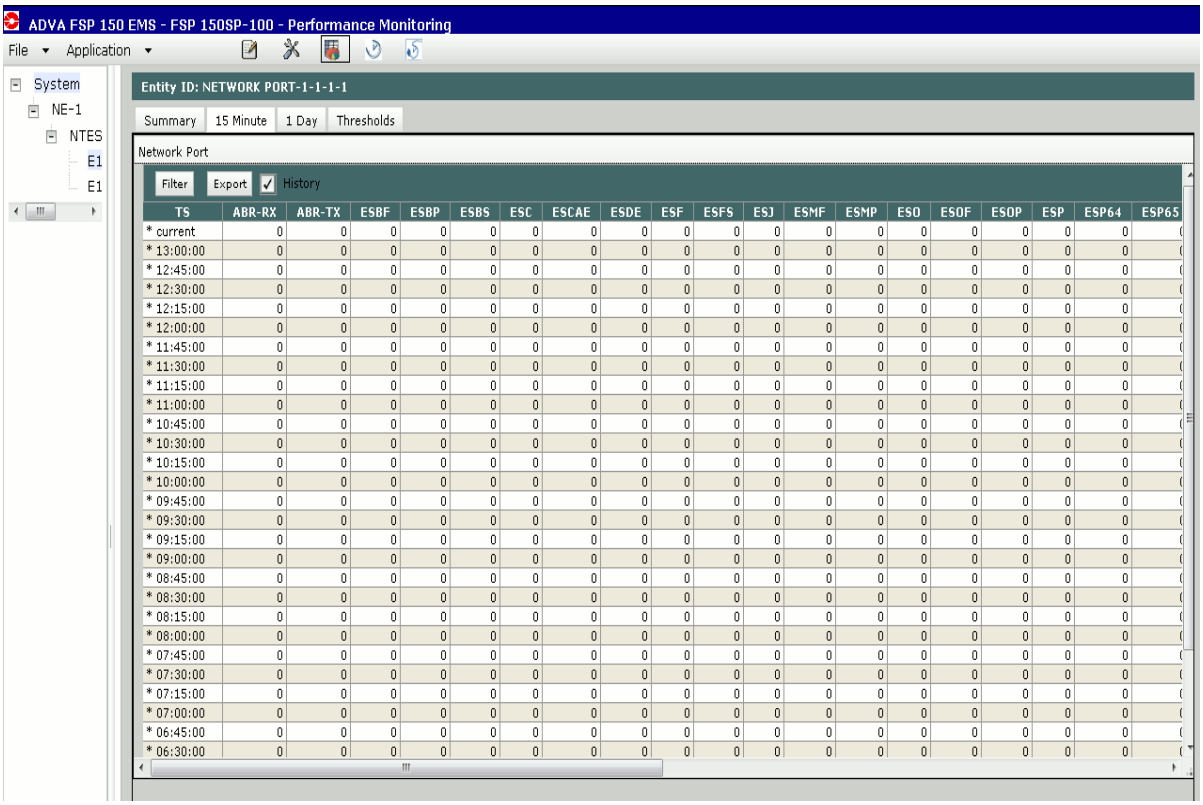

Figure 197: Current PM Threshold View of a Network Port

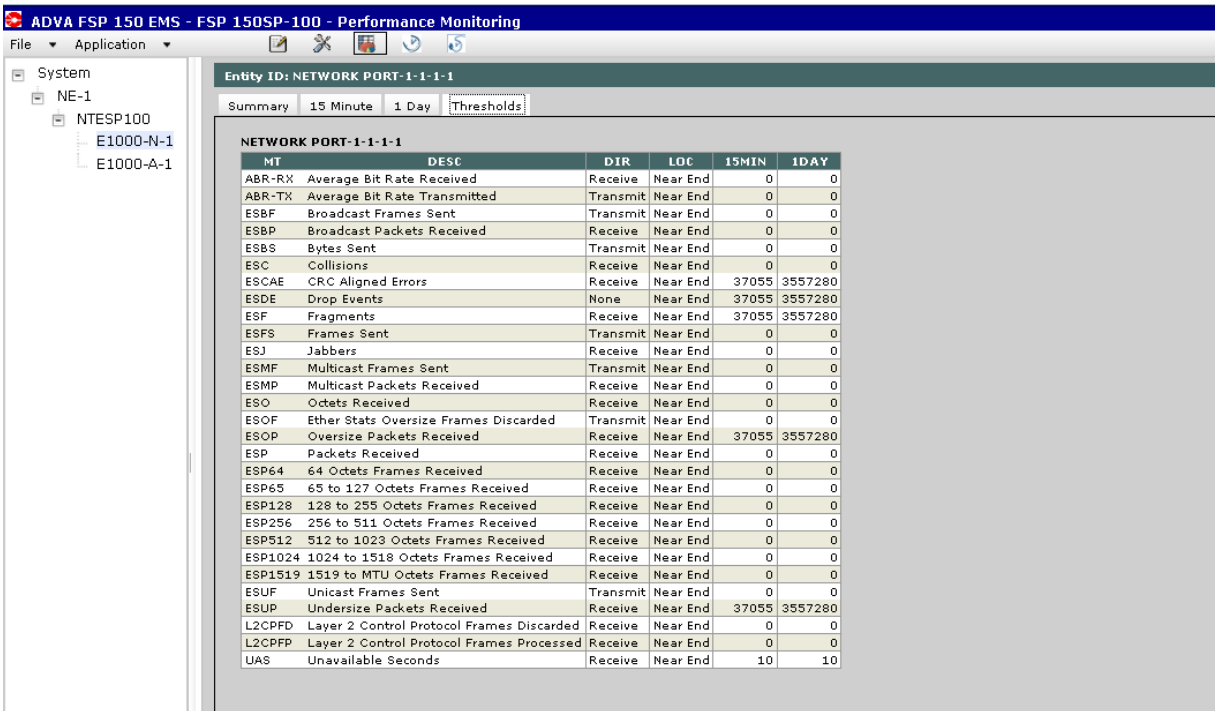
ADVA FSP 150 EMS - FSP 150SP-100 - Performance Monitoring
File
Application
System
NE-1
NTESP100
E1000-N-1
E1000-A-1
Entity ID: NETWORK PORT-1-1-1-1
Summary
15 Minute
1 Day
Thresholds
NETWORK PORT-1-1-1-1
MT DESC DIR LOC 15MIN 1DAY
ABR-RX Average Bit Rate Received Receive Near End 0 0
ABR-TX Average Bit Rate Transmitted Transmit Near End 0 0
ESBF Broadcast Frames Sent Transmit Near End 0 0
ESBP Broadcast Packets Received Receive Near End 0 0
ESBS Bytes Sent Transmit Near End 0 0
ESC Collisions Receive Near End 0 0
ESCAE CRC Aligned Errors Receive Near End 37055 3557280
ESDE Drop Events None Near End 37055 3557280
ESF Fragments Receive Near End 37055 3557280
ESFS Frames Sent Transmit Near End 0 0
ESJ Jabbers Receive Near End 0 0
ESMF Multicast Frames Sent Transmit Near End 0 0
ESMP Multicast Packets Received Receive Near End 0 0
ESO Octets Received Receive Near End 0 0
ESOF Ether Stats Oversize Frames Discarded Transmit Near End 0 0
ESOP Oversize Packets Received Receive Near End 37055 3557280
ESP Packets Received Receive Near End 0 0
ESP64 64 Octets Frames Received Receive Near End 0 0
ESP65 65 to 127 Octets Frames Received Receive Near End 0 0
ESP128 128 to 255 Octets Frames Received Receive Near End 0 0
ESP256 256 to 511 Octets Frames Received Receive Near End 0 0
ESP512 512 to 1023 Octets Frames Received Receive Near End 0 0
ESP1024 1024 to 1518 Octets Frames Received Receive Near End 0 0
ESP1519 1519 to MTU Octets Frames Received Receive Near End 0 0
ESUF Unicast Frames Sent Transmit Near End 0 0
ESUP Undersize Packets Received Receive Near End 37055 3557280
L2CPFD Layer 2 Control Protocol Frames Discarded Receive Near End 0 0
L2CPFP Layer 2 Control Protocol Frames Processed Receive Near End 0 0
UAS Unavailable Seconds Receive Near End 10 10

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Figure 198: Exporting 15 Minute PM Counts to Excel

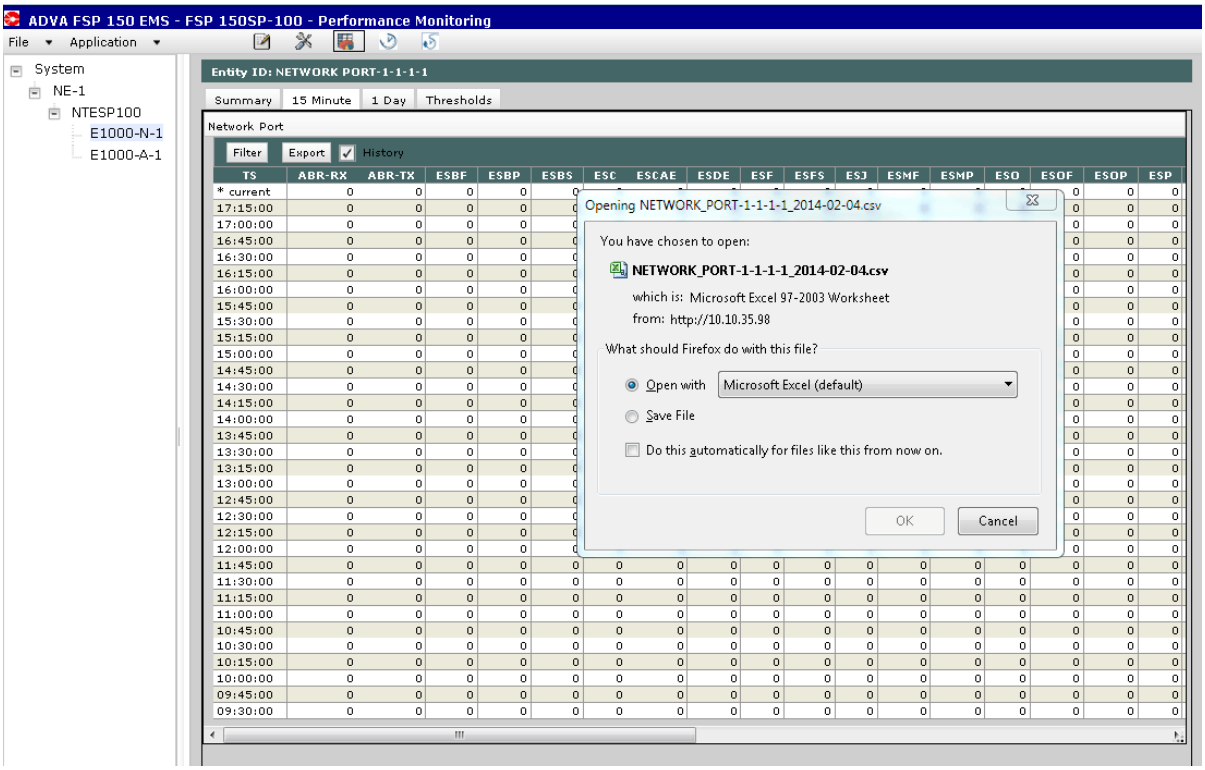

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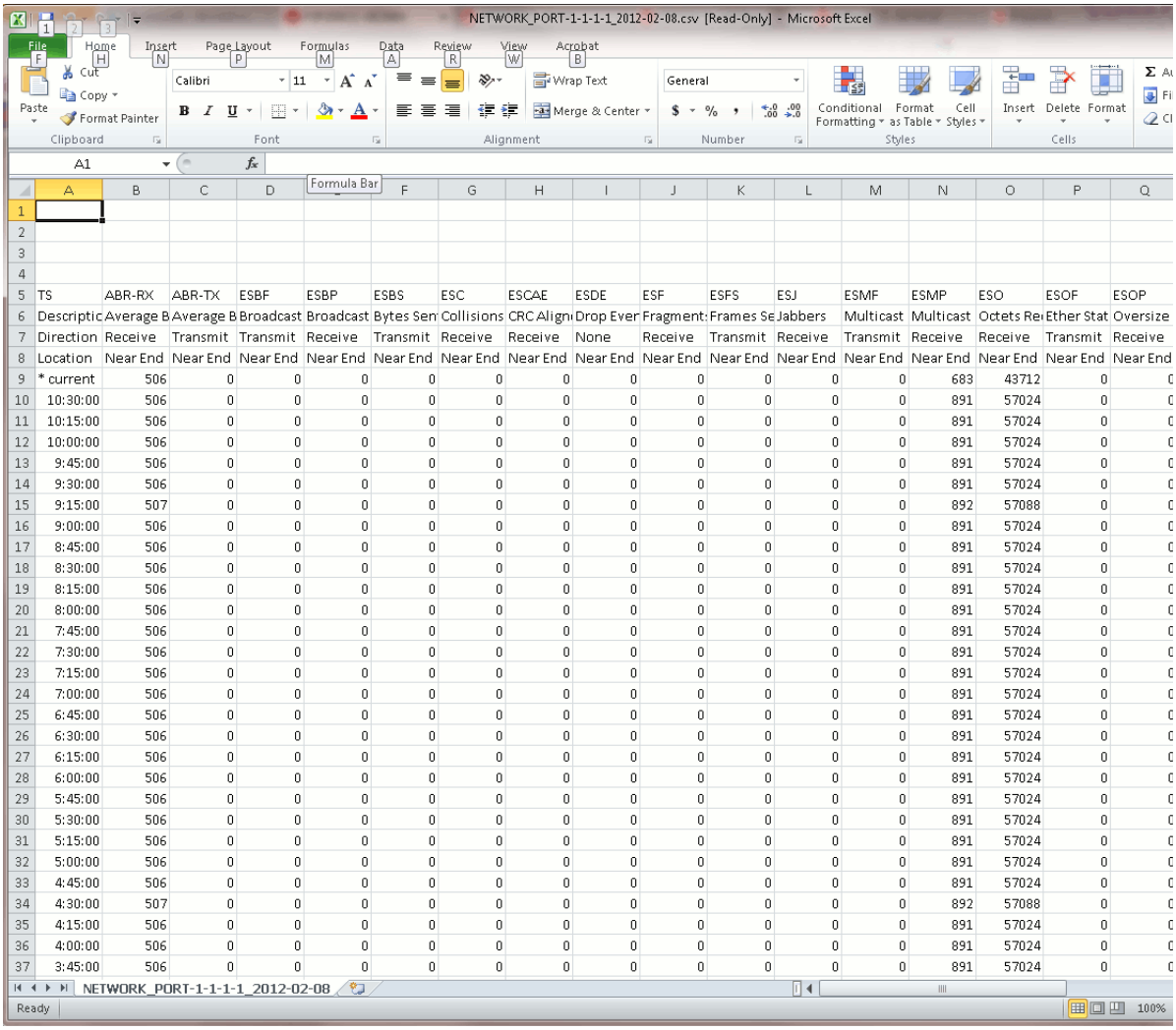
Figure 199: 15 Minute PM Counts Exported to Excel



NETWORK_PORT-1-1-1-1_2012-02-08.csv [Read-Only] - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
5	TS	ABR-RX	ABR-TX	ESBF	ESBP	ESBS	ESC	ESCAE	ESDE	ESF	ESFS	ESJ	ESMF	ESMP	ESO	ESOF	ESOP
6	Descriptic	Average B	Average B	Broadcast	Broadcast	Bytes Sen	Collisions	CRC Align	Drop Ever	Fragment	Frames Se	Jabbers	Multicast	Multicast	Octets Re	Ether Stat	Oversize
7	Direction	Receive	Transmit	Transmit	Receive	Transmit	Receive	Receive	None	Receive	Transmit	Receive	Transmit	Receive	Receive	Transmit	Receive
8	Location	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End	Near End
9	* current	506	0	0	0	0	0	0	0	0	0	0	0	683	43712	0	0
10	10:30:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
11	10:15:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
12	10:00:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
13	9:45:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
14	9:30:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
15	9:15:00	507	0	0	0	0	0	0	0	0	0	0	0	892	57088	0	0
16	9:00:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
17	8:45:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
18	8:30:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
19	8:15:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
20	8:00:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
21	7:45:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
22	7:30:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
23	7:15:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
24	7:00:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
25	6:45:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
26	6:30:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
27	6:15:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
28	6:00:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
29	5:45:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
30	5:30:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
31	5:15:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
32	5:00:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
33	4:45:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
34	4:30:00	507	0	0	0	0	0	0	0	0	0	0	0	892	57088	0	0
35	4:15:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
36	4:00:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0
37	3:45:00	506	0	0	0	0	0	0	0	0	0	0	0	891	57024	0	0

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Initializing PM Registers

For Network Port and Access Port entities, PM data is maintained in individual monitored parameter bins for each interval. The system maintains bins for the following time periods:

- Current 15-minute (or 5 Minute) bin
- Current 24-hour (1-day) bin

Current intervals are indicated as “current” and older periods are assigned incremental numbers. The index allows a user to identify the current, previous (Bin Index=1) or one of the historical bins (Bin Index = 2 to 32), with 32 being the oldest bin.

Procedure

Step 1 Select the Performance Monitoring icon or select Performance Monitoring from the Applications menu, then expand the System selection tree.

Step 2 Expand the Network Element entity form the selection tree, then expand the NTESP100 entity.

Step 3 Enter a right click on the desired Network Port and Access Port in the selection tree. To initialize Network Port or Access Port counters, select Init Registers.

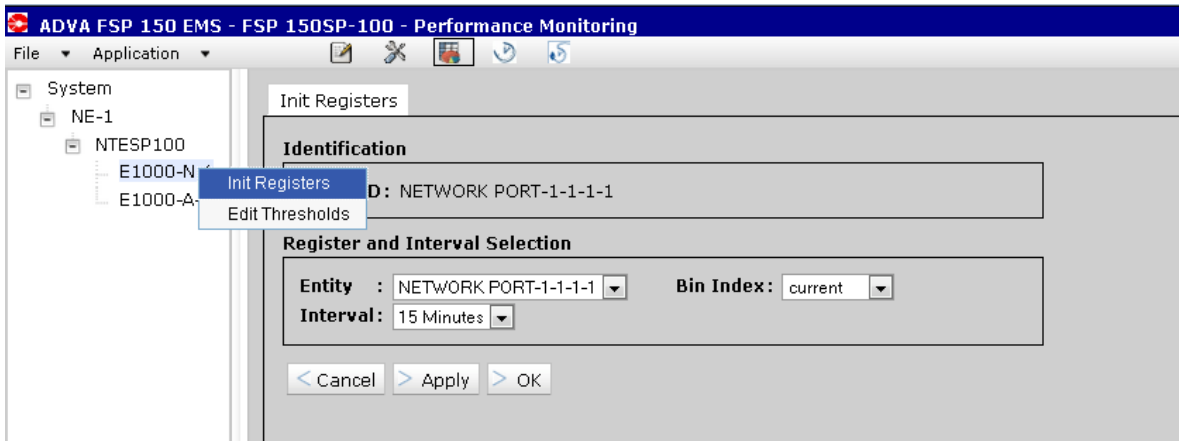
An Initialize Registers pane appears (see Figure 200 on p. 331)

Step 4 Select the desired Interval and Bin Index. Select **OK**.

The designated PM count registers are cleared

End of Procedure

Figure 200: Initialize PM Registers Pane



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Editing PM Thresholds

Each Performance Parameter (PP) has a threshold for each bin period which is configurable for each entity instance. The PP count is compared to the configured threshold and if met or exceeded, a Threshold Crossing Alert (TCA) is generated.

Provisioning a threshold to zero disables threshold monitoring for that entity.

Note

Each Network Port and Access Port entity type has default thresholds for its PPs, which are used when an entity is provisioned. The default thresholds are configurable.

Procedure

Step 1 Select the Performance Monitoring icon or select **Performance Monitoring** from the Applications menu, then expand the System selection tree.

Step 2 Expand the Network Element entity from the selection tree, then expand the NTESP100 entity.

Step 3 Enter a right click on the desired Network Port or Access Port in the selection tree and select **Edit Thresholds**.

An Edit Thresholds pane appears (*see* Figure 201 on p. 332)

Step 4 Select the Network Port or Access Port entity and then select **OK**.

An Edit Thresholds pane appears (*see* Figure 202 on p. 333)

Step 5 Edit the desired thresholds for the desired Monitored Type. Use sliding bars to view data, as required. Select **OK**.

End of Procedure

Figure 201: Edit PM Threshold View of a Network Port (Part 1)

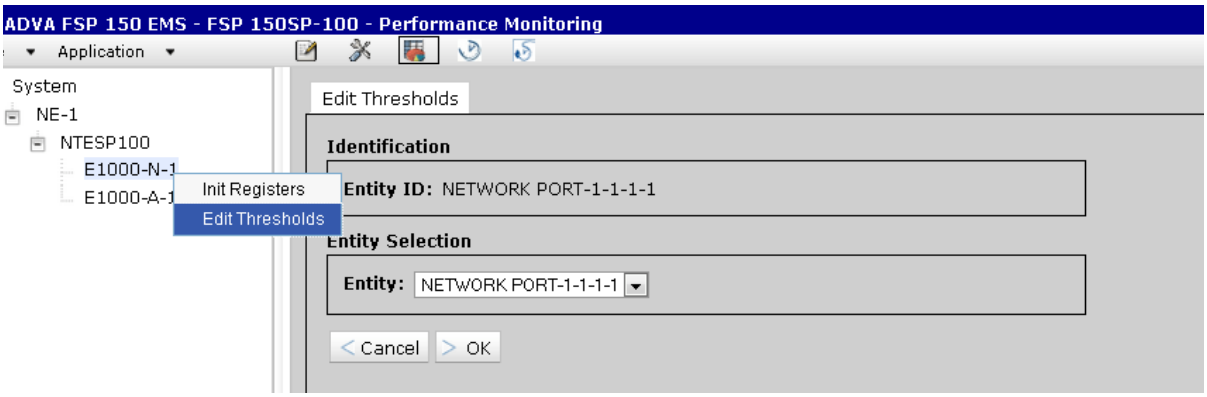

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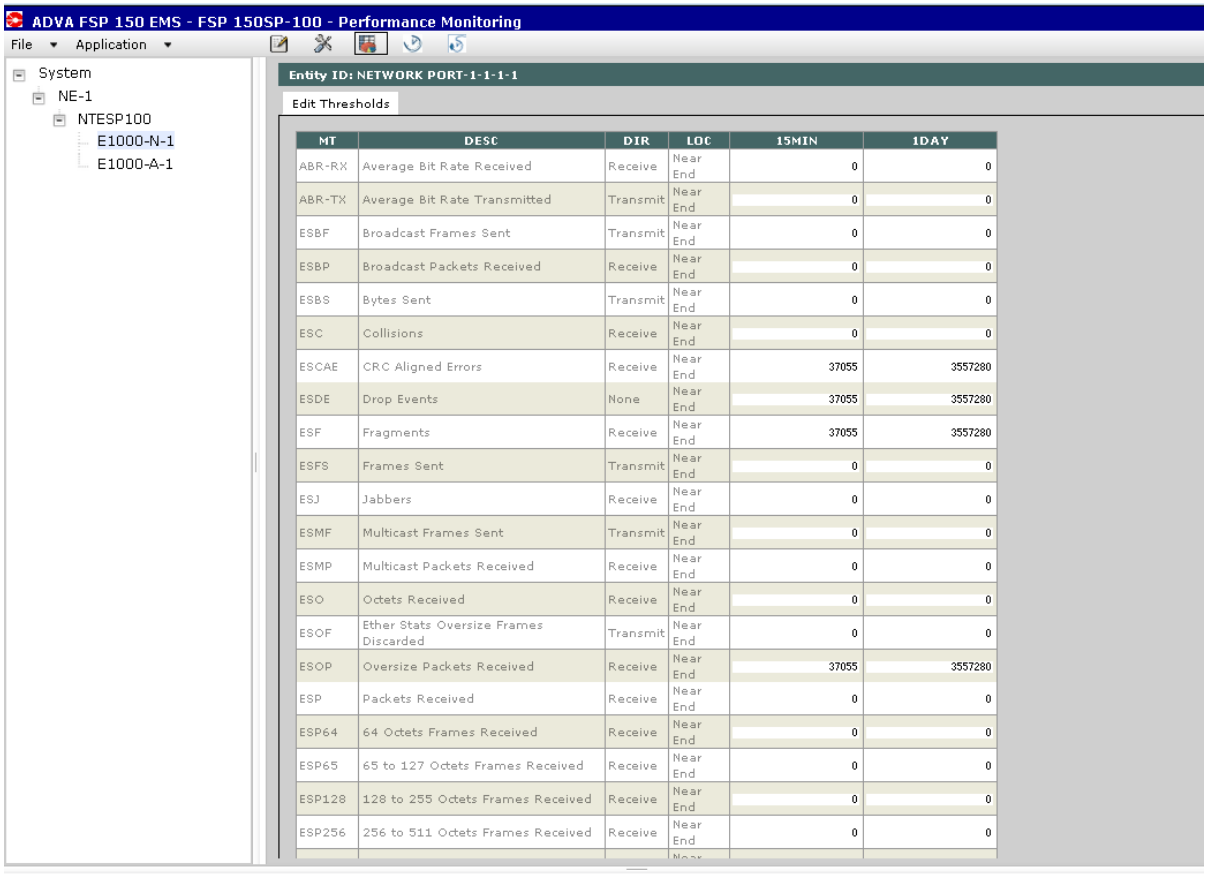
Figure 202: Edit PM Threshold View of a Network Port (Part 2)



MT	DESC	DIR	LOC	15MIN	1DAY
ABR-RX	Average Bit Rate Received	Receive	Near End	0	0
ABR-TX	Average Bit Rate Transmitted	Transmit	Near End	0	0
ESBF	Broadcast Frames Sent	Transmit	Near End	0	0
ESBP	Broadcast Packets Received	Receive	Near End	0	0
ESBS	Bytes Sent	Transmit	Near End	0	0
ESC	Collisions	Receive	Near End	0	0
ESCAE	CRC Aligned Errors	Receive	Near End	37055	3557280
ESDE	Drop Events	None	Near End	37055	3557280
ESF	Fragments	Receive	Near End	37055	3557280
ESFS	Frames Sent	Transmit	Near End	0	0
ESJ	Jabbers	Receive	Near End	0	0
ESMF	Multicast Frames Sent	Transmit	Near End	0	0
ESMP	Multicast Packets Received	Receive	Near End	0	0
ESO	Octets Received	Receive	Near End	0	0
ESOF	Ether Stats Oversize Frames Discarded	Transmit	Near End	0	0
ESOP	Oversize Packets Received	Receive	Near End	37055	3557280
ESP	Packets Received	Receive	Near End	0	0
ESP64	64 Octets Frames Received	Receive	Near End	0	0
ESP65	65 to 127 Octets Frames Received	Receive	Near End	0	0
ESP128	128 to 255 Octets Frames Received	Receive	Near End	0	0
ESP256	256 to 511 Octets Frames Received	Receive	Near End	0	0

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PTP and SyncJack Performance Monitoring

Overview

The SP-100 PTP feature provides Performance Monitoring (PM) for PTP Flowpoints and the Slave Only Ordinary Clock (SOOC). Additionally, the SyncJack feature provides stats for the Telecom Slave (TS), Clock Probes (Clock Accuracy), PTP Clock Probes (Clock Analysis) and the PTP Network Probe (PTP Network Analysis) as well has history results for Clock Probes (Clock Accuracy) and PTP Clock Probes (Clock Analysis). These PMs follow the same patterns and rules as the Ethernet interface PMs (see “Network/Access Port Performance Monitoring” on p. 321)

The Performance Monitoring (PM) feature enables in-service, non-intrusive system monitoring to aid in diagnosing and isolating issues that may occur during operation. PM enables users to detect and react to potential failures prior to a customer outage. In addition to providing traditional SNMP MIB Etherstats, Syncjack® provides Performance Parameters (PPs) and features similar to those found in traditional services. This allows Ethernet service assurance to be integrated into a carrier’s existing service assurance infrastructure.

Performance Monitoring view allows you to view performance monitoring counts and view PM thresholds. Performance monitoring thresholds can be edited, and registers can be initialized (for users with proper user access permission level).

This chapter contains the following step by step procedures:

- “Viewing PTP Flowpoint and SOOC PM Counts and Threshold Values” on p. 337
- “Initializing PTP Flowpoint and SOOC PM Registers” on p. 341
- “Editing PTP Flowpoint and SOOC PM Thresholds” on p. 342
- “SP-100 Probing Features” on p. 345
- “Performing Clock Accuracy Testing” on p. 348
- “Performing Clock Analysis” on p. 360
- “Performing PTP Network Analysis” on p. 372

For PM commands using CLI, refer to the *FSP 150SP-100 Command Line Reference Guide.*

PM Features

The following features are provided:

- retrievable performance data for each managed entity, so the user can determine past and current system operation. PM data collection is performed via a polling mechanism, were primitives are gathered into accumulated counts. After a defined interval, (e.g., 15 minutes or 1 day), the counts are binned and stored in a database.
- the checking of PM counts against a threshold to see if the threshold has been crossed. If so, a Threshold Crossing Alert (TCA) is reported, so that corrective actions can be taken.

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PM supports:

- threshold setting and automatic TCA message generation
- Current and History PM bins provide a continuous record of service performance, allowing for accurate SLA conformance statements.

PM counts can be displayed as a summary or in tabular format in the eVision web browser management tool, can be filtered and/or refreshed and allows exporting data as Excel spreadsheets.

Performance Parameters

There are several categories of Performance Parameters (PPs) that are collected. The following entities are monitored for performance data which is accumulated into PPs:

- PTP Flowpoint
- SOOC
- Telecom Slave (under SyncJack application)

Performance Parameter Attributes

Each PP can be defined by the attributes outlined in the following table.

Table 24: Performance Parameter Attributes

Attribute	Description
Monitor Type	The name of the PP. This will be presented in mnemonic form (e.g. ANNOUNCESRX (PTP Announce Messages Received).
Location	Whether the PP is a Near-End or Far-End parameter. The location is determined in relation to the monitored entity, in that the PP has occurred: • Locally to the entity (or at the near end). • Remotely to the entity (or at the far end).
Direction	Whether the PP is a Receive or Transmit parameter. The direction is in relation to the monitored entity.
Time Period	The time period associated with the PP. i.e., 15-Minute or 1-Day.
Monitor Timestamp	The time at which the PP was collected: • The current time is used for Rollover and Current counters. • The boundary crossing time is used for History counters (stored as number of seconds since the Epoch).
History Index	Indicates a bin from the historical list of bins: • For 15 Minute history bins, this number is 1 to 32 (1 being the most recent). • For 1 Day history bins, this number is 1. • For current and Rollover bins, this number is 0.

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Performance Parameter Counters

Each PP is grouped together for a monitored entity and accumulated into Bins, associated with a predefined time period (i.e., 15-Minute or 1-Day).

The user can reset any individual or all PP counters to zero.

Bins and Bin Periods

The following performance bin periods will exist:

- 1 x Current 15-Minute Bin
- 1 x Current 1-Day (24-Hour) Bin
- 32 x Historical 15-Minute Bins
- 1 x Historical 1-Day (24-Hour) Bin

Note

(1) The 32 Historical 15-Minute Bins provide the most recent 8 hours of performance data.
(2) The Historical 1-Day Bin provides the performance data from the previous day starting from 12:00am (i.e., midnight, 00:00).

Performance Parameter Thresholding

Each PP has a threshold for each bin period which is configurable for each entity instance. The PP count is compared to the configured threshold and if met or exceeded, a Threshold Crossing Alert (TCA) is generated.

Note

Provisioning a threshold to zero will disable threshold monitoring for that entity.

Each entity type has default thresholds for its PPs, which are used when an entity is provisioned. The default thresholds are configurable.

A TCA is only reported once during a bins time period unless it is initialized and then is crossed again.

Threshold Crossing Alert Messages

When a PP threshold has been met or exceeded, a TCA is generated. The following table outlines the attributes that are specified in the TCA message.

Table 25: Threshold Crossing Alert Attributes

Attribute	Description	Values
Entity Identifier	The monitored entity's id	Variable.
Monitor Type	The name of the PP that has crossed its threshold. This will be presented in mnemonic form.	See "Performance Monitoring Settings" on p. 478 for Monitor Type mnemonics.
Time Period	In which time period the threshold was crossed.	15-Minute 1-Day
Time	The time the threshold was crossed.	Timestamp

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Table 25: Threshold Crossing Alert Attributes (Continued)

Attribute	Description	Values
Location	The location of the TCA generation. This is determined in relation to the monitored entity, in that the PP has occurred: • Locally to the entity (or at the near end) • Remotely to the entity (or at the far end).	Near end Far end None
Direction	The direction in relation to the monitored entity.	Receive Transmit
Monitored Value	The value of the PP count when the threshold was crossed.	Up to a 64-bit number
Threshold Value	The configured threshold at the time the threshold was crossed.	Up to a 64-bit number

Monitored Types and Default TCA Settings

Refer to "Performance Monitoring Settings" on p. 478 for monitored types and default Threshold Crossing Alert (TCA) settings.

Viewing PTP Flowpoint and SOOC PM Counts and Threshold Values

By selecting a PTP Flowpoint or SOOC in the Selection Tree Pane in the PTP application, the following tabs are provided in the Details Pane for each entity:

- Summary, which displays a summary of both transmit and receive statistics. See Figure 203 on p. 338 for an example view of a Network Port summary.
- 15 Minute, which displays the PM counts in the current 15 Minute performance bin. See Figure 204 on p. 339 for an example view of a PTP Flowpoint 15 Minute PM counters. If the History checkbox is selected the previous periods are also displayed.
- 1 Day, which displays the PM counts in the current 1 Day performance bin. If the History checkbox is selected the previous period is also displayed.
- Thresholds, which displays the details and the thresholds that have been set for each PP. See Figure 205 on p. 339 for an example view of a Network Port Threshold values.

Procedure

Step 1 Select the PTP icon or select PTP from the Applications menu, then expand the System selection tree.

Step 2 Expand the Network Element entity from the selection tree, then expand the NTESP100 entity. To view PTP Flowpoint PM counts, also expand the Network or Access entity in the selection tree.

Step 3 Select the desired entity in the selection tree and select the Statistics tab.

The PM Counts pane appears (see Figure 203 on p. 338)

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Step 4 Select the desired tab to view Summary, 15 Minute counters, 1 Day counters or Threshold levels. Use sliding bars to view data, as required. An asterisk in the Time column indicates data that is suspect. (See Figure 204 on p. 339 and Figure 205 on p. 339.)

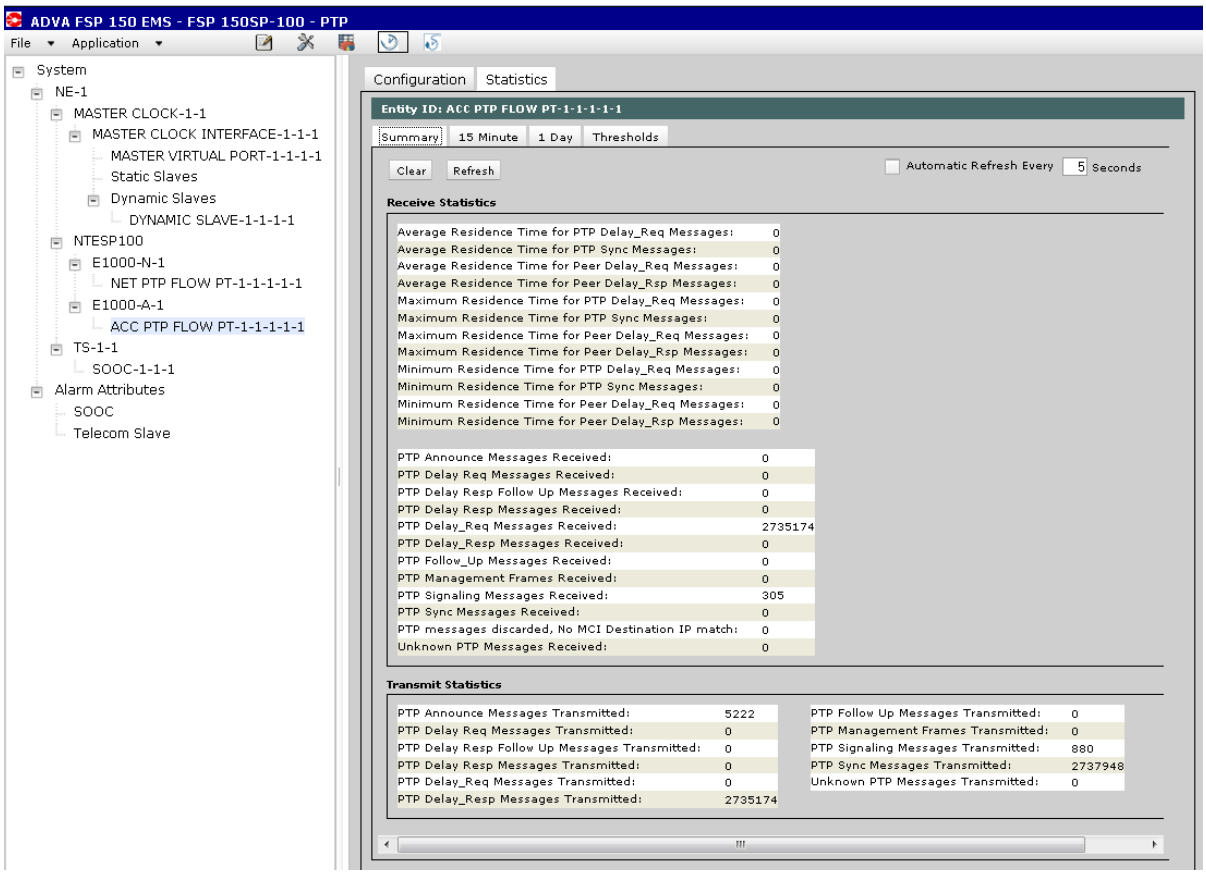
Step 5 If desired, 15 Minute and 1 Day counts can be exported to an Excel spreadsheet by selecting the Excel button.

An export file pane appears (see Figure 206 on p. 340).

Step 6 Choose the desired application to open, or select the Save to Disk option. The filename dispexecel.php will be created in the selected application (Excel is the default application - see Figure 199 on p. 330). Edit or save the exported file as desired.

End of Procedure

Figure 203: Summary PM Counts View of a PTP Flowpoint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File
Application
System
NE-1
MASTER CLOCK-1-1
MASTER CLOCK INTERFACE-1-1-1
MASTER VIRTUAL PORT-1-1-1-1
Static Slaves
Dynamic Slaves
DYNAMIC SLAVE-1-1-1-1
NTESP100
E1000-N-1
NET PTP FLOW PT-1-1-1-1-1
E1000-A-1
ACC PTP FLOW PT-1-1-1-1-1
TS-1-1
SOOC-1-1-1
Alarm Attributes
SOOC
Telecom Slave
Configuration
Statistics
Entity ID: ACC PTP FLOW PT-1-1-1-1-1
Summary
15 Minute
1 Day
Thresholds
Clear
Refresh
Automatic Refresh Every
5
Seconds
Receive Statistics
Average Residence Time for PTP Delay_Req Messages: 0
Average Residence Time for PTP Sync Messages: 0
Average Residence Time for Peer Delay_Req Messages: 0
Average Residence Time for Peer Delay_Rsp Messages: 0
Maximum Residence Time for PTP Delay_Req Messages: 0
Maximum Residence Time for PTP Sync Messages: 0
Maximum Residence Time for Peer Delay_Req Messages: 0
Maximum Residence Time for Peer Delay_Rsp Messages: 0
Minimum Residence Time for PTP Delay_Req Messages: 0
Minimum Residence Time for PTP Sync Messages: 0
Minimum Residence Time for Peer Delay_Req Messages: 0
Minimum Residence Time for Peer Delay_Rsp Messages: 0
PTP Announce Messages Received: 0
PTP Delay Req Messages Received: 0
PTP Delay Resp Follow Up Messages Received: 0
PTP Delay Resp Messages Received: 0
PTP Delay_Req Messages Received: 2735174
PTP Delay_Resp Messages Received: 0
PTP Follow_Up Messages Received: 0
PTP Management Frames Received: 0
PTP Signaling Messages Received: 305
PTP Sync Messages Received: 0
PTP messages discarded, No MCI Destination IP match: 0
Unknown PTP Messages Received: 0
Transmit Statistics
PTP Announce Messages Transmitted: 5222
PTP Delay Req Messages Transmitted: 0
PTP Delay Resp Follow Up Messages Transmitted: 0
PTP Delay Resp Messages Transmitted: 0
PTP Delay_Req Messages Transmitted: 0
PTP Delay_Resp Messages Transmitted: 2735174
PTP Follow Up Messages Transmitted: 0
PTP Management Frames Transmitted: 0
PTP Signaling Messages Transmitted: 880
PTP Sync Messages Transmitted: 2737948
Unknown PTP Messages Transmitted: 0

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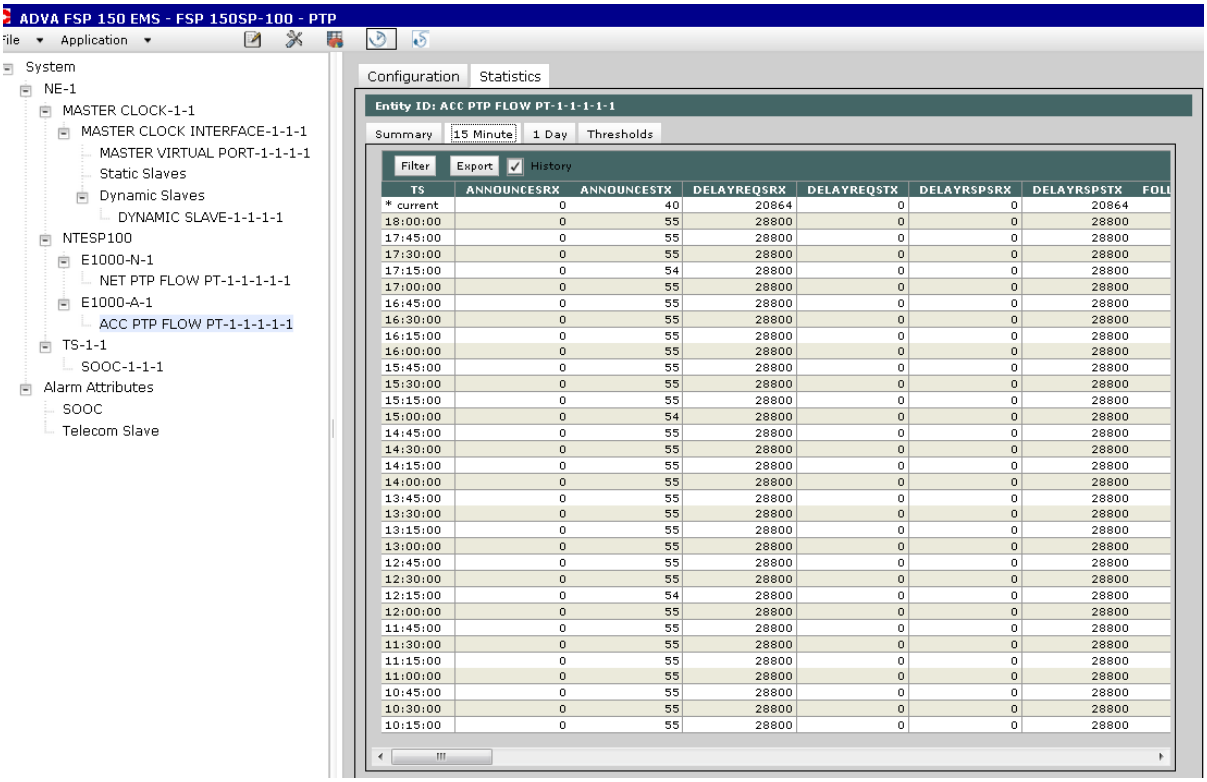
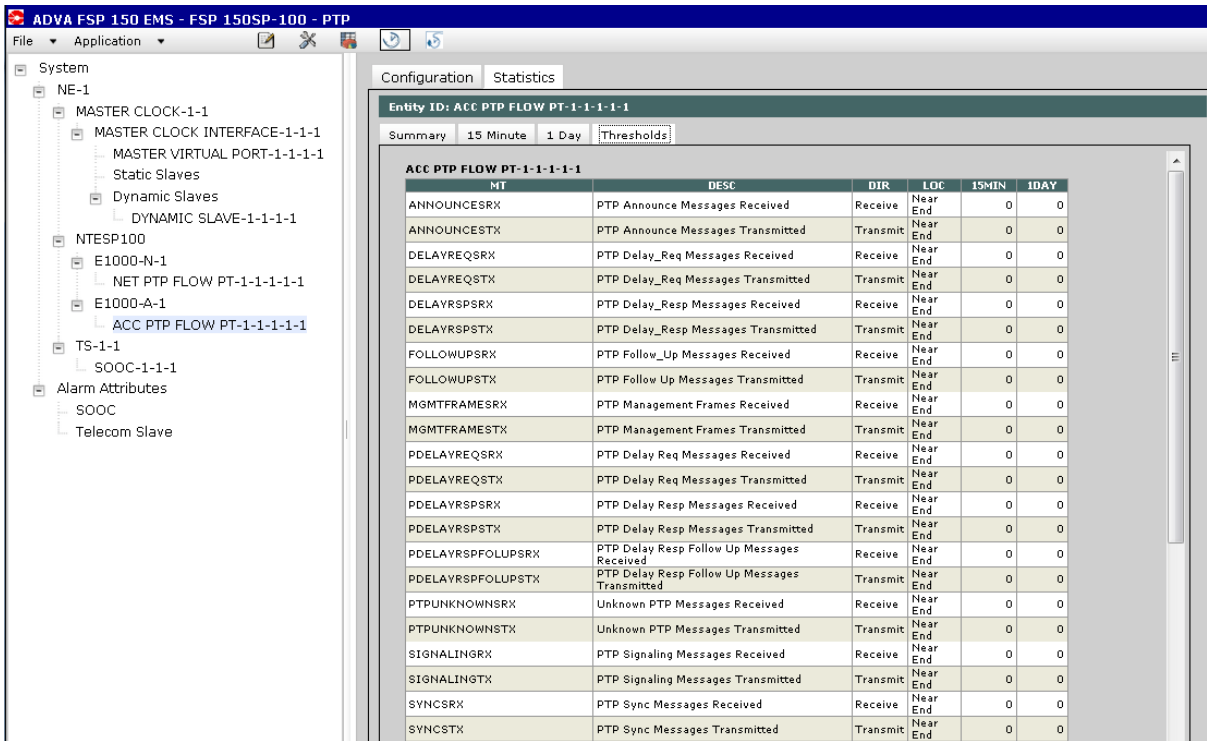
Figure 204: 15 Minute PM Counts View of a PTP Flowpoint



TS	ANNOUNCESRX	ANNOUNCESTX	DELAYREQSRX	DELAYREQSTX	DELAYRSPSRX	DELAYRSPSTX	FOLL
* current	0	40	20864	0	0	20864	
18:00:00	0	55	28800	0	0	28800	
17:45:00	0	55	28800	0	0	28800	
17:30:00	0	55	28800	0	0	28800	
17:15:00	0	54	28800	0	0	28800	
17:00:00	0	55	28800	0	0	28800	
16:45:00	0	55	28800	0	0	28800	
16:30:00	0	55	28800	0	0	28800	
16:15:00	0	55	28800	0	0	28800	
16:00:00	0	55	28800	0	0	28800	
15:45:00	0	55	28800	0	0	28800	
15:30:00	0	55	28800	0	0	28800	
15:15:00	0	55	28800	0	0	28800	
15:00:00	0	54	28800	0	0	28800	
14:45:00	0	55	28800	0	0	28800	
14:30:00	0	55	28800	0	0	28800	
14:15:00	0	55	28800	0	0	28800	
14:00:00	0	55	28800	0	0	28800	
13:45:00	0	55	28800	0	0	28800	
13:30:00	0	55	28800	0	0	28800	
13:15:00	0	55	28800	0	0	28800	
13:00:00	0	55	28800	0	0	28800	
12:45:00	0	55	28800	0	0	28800	
12:30:00	0	55	28800	0	0	28800	
12:15:00	0	54	28800	0	0	28800	
12:00:00	0	55	28800	0	0	28800	
11:45:00	0	55	28800	0	0	28800	
11:30:00	0	55	28800	0	0	28800	
11:15:00	0	55	28800	0	0	28800	
11:00:00	0	55	28800	0	0	28800	
10:45:00	0	55	28800	0	0	28800	
10:30:00	0	55	28800	0	0	28800	
10:15:00	0	55	28800	0	0	28800	

Figure 205: Current PM Threshold View of a PTP Flowpoint



ACC PTP FLOW PT-1-1-1-1-1

MT	DESC	DIR	LOC	15MIN	1DAY
ANNOUNCESRX	PTP Announce Messages Received	Receive	Near End	0	0
ANNOUNCESTX	PTP Announce Messages Transmitted	Transmit	Near End	0	0
DELAYREQSRX	PTP Delay_Req Messages Received	Receive	Near End	0	0
DELAYREQSTX	PTP Delay_Req Messages Transmitted	Transmit	Near End	0	0
DELAYRSPSRX	PTP Delay_Resp Messages Received	Receive	Near End	0	0
DELAYRSPSTX	PTP Delay_Resp Messages Transmitted	Transmit	Near End	0	0
FOLLOWUPSRX	PTP Follow_Up Messages Received	Receive	Near End	0	0
FOLLOWUPSTX	PTP Follow Up Messages Transmitted	Transmit	Near End	0	0
MGMTFRAMESRX	PTP Management Frames Received	Receive	Near End	0	0
MGMTFRAMESTX	PTP Management Frames Transmitted	Transmit	Near End	0	0
PDELAYREQSRX	PTP Delay Req Messages Received	Receive	Near End	0	0
PDELAYREQSTX	PTP Delay Req Messages Transmitted	Transmit	Near End	0	0
PDELAYRSPSRX	PTP Delay Resp Messages Received	Receive	Near End	0	0
PDELAYRSPSTX	PTP Delay Resp Messages Transmitted	Transmit	Near End	0	0
PDELAYRSPFOLUPSRX	PTP Delay Resp Follow Up Messages Received	Receive	Near End	0	0
PDELAYRSPFOLUPSTX	PTP Delay Resp Follow Up Messages Transmitted	Transmit	Near End	0	0
PTPUNKNOWNSRX	Unknown PTP Messages Received	Receive	Near End	0	0
PTPUNKNOWNSTX	Unknown PTP Messages Transmitted	Transmit	Near End	0	0
SIGNALINGRX	PTP Signaling Messages Received	Receive	Near End	0	0
SIGNALINGTX	PTP Signaling Messages Transmitted	Transmit	Near End	0	0
SYNCSRX	PTP Sync Messages Received	Receive	Near End	0	0
SYNCSTX	PTP Sync Messages Transmitted	Transmit	Near End	0	0

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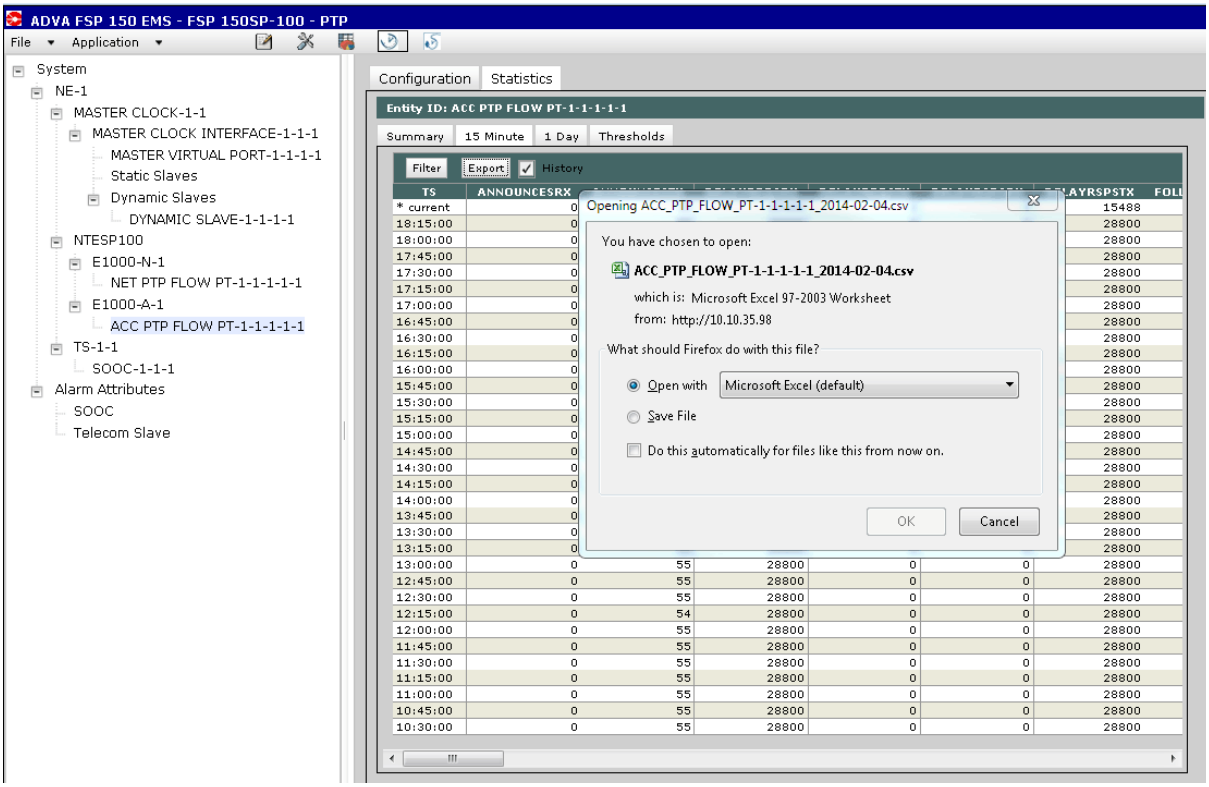
Figure 206: Exporting 15 Minute PM Counts to Excel



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Initializing PTP Flowpoint and SOOC PM Registers

For PTP entities, PM data is maintained in individual monitored parameter bins for each interval. The system maintains bins for the following time periods:

- Current 15-minute bin
- Current 24-hour (1-day) bin

Current intervals are indicated as “current” and older periods are assigned incremental numbers. The index allows a user to identify the current, previous (Bin Index=1) or one of the historical bins (Bin Index = 2 to 32), with 32 being the oldest bin, or All History.

Procedure

Step 1 Select the PTP icon or select PTP from the Applications menu, then expand the System selection tree.

Step 2 Expand the Network Element entity form the selection tree, then expand the NTESP100 entity. Expand the E1000-A-1/E1000-N-1 entity.

Step 3 Enter a right click on the desired PTP Flowpoint entity in the selection tree. To initialize counters, select Init Registers.

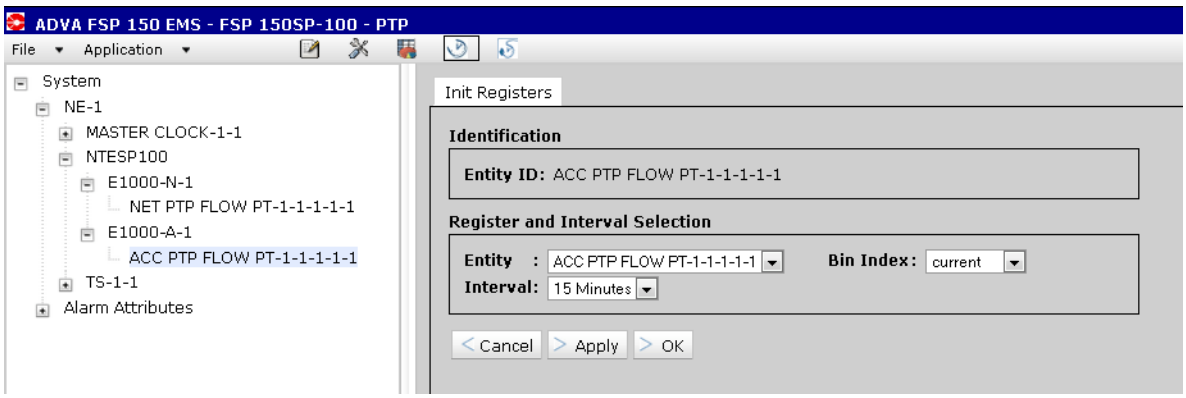
An Initialize Registers pane appears (see Figure 207 on p. 341)

Step 4 Select the desired Interval and Bin Index. Select **OK**.

The designated PM count registers are cleared

End of Procedure

Figure 207: Initialize PTP Flowpoint PM Registers Pane



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Editing PTP Flowpoint and SOOC PM Thresholds

Each Performance Parameter (PP) has a threshold for each bin period which is configurable for each entity instance. The PP count is compared to the configured threshold and if met or exceeded, a Threshold Crossing Alert (TCA) is generated.

Note

Provisioning a threshold to zero disables threshold monitoring for that entity.

Each entity type has default thresholds for its PPs, which are used when an entity is provisioned. The default thresholds are configurable.

Procedure

Step 1 Select the PTP icon or select **PTP** from the Applications menu, then expand the System and Network Element entities in the selection tree.

Step 2 For Network/ Access PTP Flowpoint: Expand the NTESP100 entity, then expand the E1000-A-1/E1000-N-1 entity. For SOOC: Expand the TS-1-1 entity.

Step 3 Enter a right click on the desired entity in the selection tree and select **Edit Thresholds**.

An Edit Thresholds pane appears (*see* Figure 208 on p. 343)

Step 4 Edit the desired thresholds for the desired Monitored Type. Use sliding bars to view data, as required. Select **OK**.

End of Procedure

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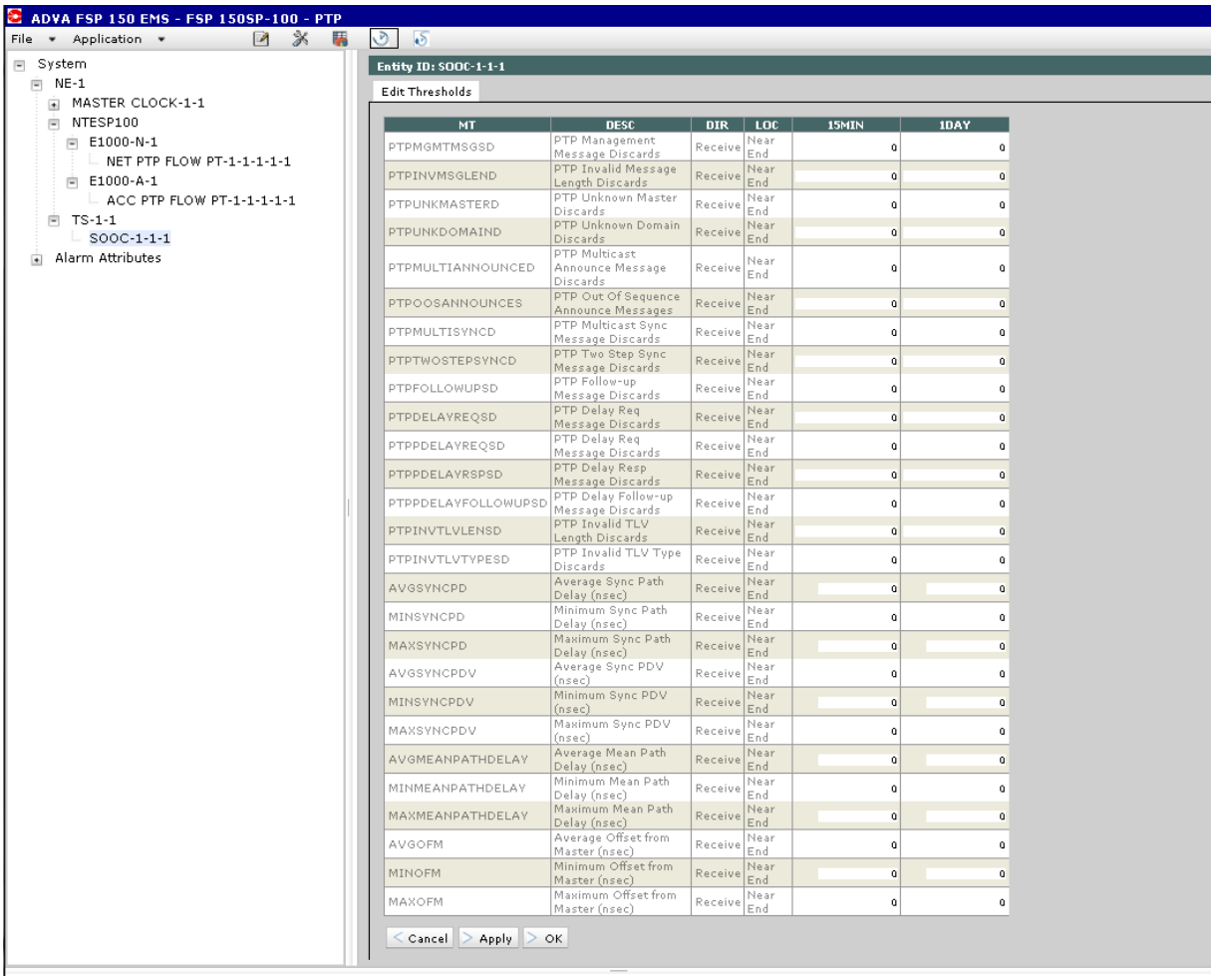
Figure 208: Edit PM Threshold View of a SOOC



MT	DESC	DIR	LOC	15MIN	1DAY
PTPMGMTMSGSD	PTP Management Message Discards	Receive	Near End	0	0
PTPINVMSGLEND	PTP Invalid Message Length Discards	Receive	Near End	0	0
PTPUNKMASTERD	PTP Unknown Master Discards	Receive	Near End	0	0
PTPUNKDOMAIND	PTP Unknown Domain Discards	Receive	Near End	0	0
PTPMULTIANNOUNCED	PTP Multicast Announce Message Discards	Receive	Near End	0	0
PTPOOSANNOUNCES	PTP Out Of Sequence Announce Messages	Receive	Near End	0	0
PTPMULTISYNCD	PTP Multicast Sync Message Discards	Receive	Near End	0	0
PTPTWOSTEPSYNCD	PTP Two Step Sync Message Discards	Receive	Near End	0	0
PTPFOLLOWUPSD	PTP Follow-up Message Discards	Receive	Near End	0	0
PTPDELAYREQSD	PTP Delay Req Message Discards	Receive	Near End	0	0
PTPPDELAYREQSD	PTP Delay Req Message Discards	Receive	Near End	0	0
PTPPDELAYRSPSD	PTP Delay Resp Message Discards	Receive	Near End	0	0
PTPPDELAYFOLLOWUPSD	PTP Delay Follow-up Message Discards	Receive	Near End	0	0
PTPINVTLVLENSD	PTP Invalid TLV Length Discards	Receive	Near End	0	0
PTPINVTLVTYPESD	PTP Invalid TLV Type Discards	Receive	Near End	0	0
AVGSYNCPD	Average Sync Path Delay (nsec)	Receive	Near End	0	0
MINSYNCPD	Minimum Sync Path Delay (nsec)	Receive	Near End	0	0
MAXSYNCPD	Maximum Sync Path Delay (nsec)	Receive	Near End	0	0
AVGSYNCPDV	Average Sync PDV (nsec)	Receive	Near End	0	0
MINSYNCPDV	Minimum Sync PDV (nsec)	Receive	Near End	0	0
MAXSYNCPDV	Maximum Sync PDV (nsec)	Receive	Near End	0	0
AVGMEANPATHDELAY	Average Mean Path Delay (nsec)	Receive	Near End	0	0
MINMEANPATHDELAY	Minimum Mean Path Delay (nsec)	Receive	Near End	0	0
MAXMEANPATHDELAY	Maximum Mean Path Delay (nsec)	Receive	Near End	0	0
AVGOFM	Average Offset from Master (nsec)	Receive	Near End	0	0
MINOFM	Minimum Offset from Master (nsec)	Receive	Near End	0	0
MAXOFM	Maximum Offset from Master (nsec)	Receive	Near End	0	0

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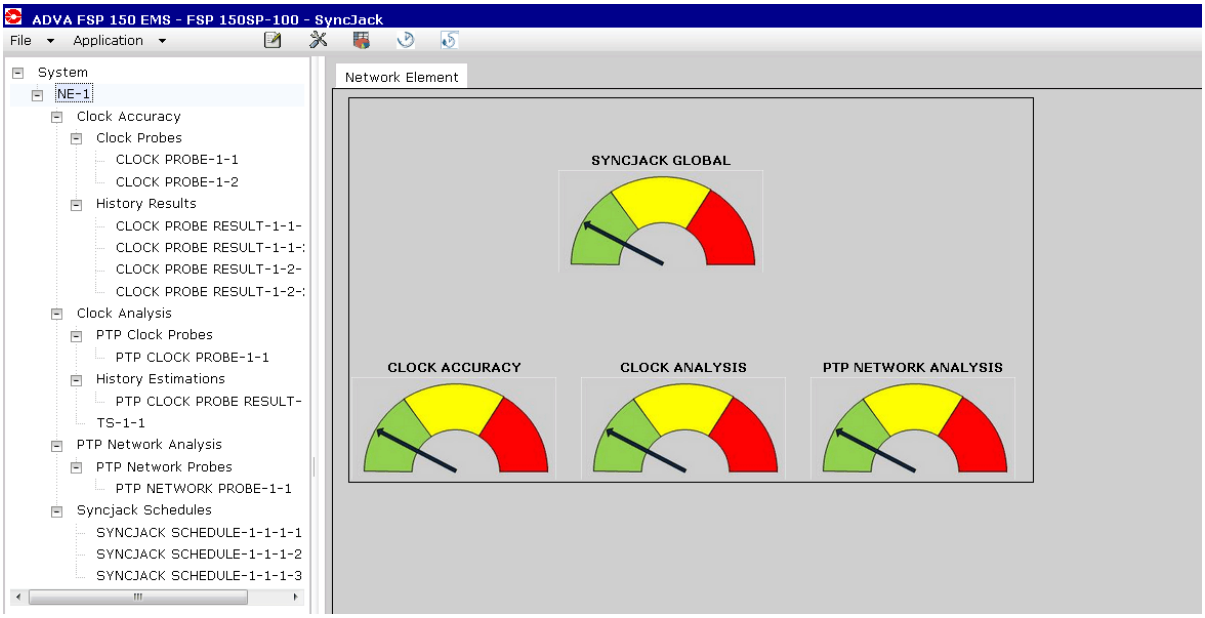
SyncJack Testing

SyncJack provisioning and reporting is invoked by selecting the SyncJack icon on the **Tool Bar** or selecting SyncJack from the Applications menu and expanding the system folder in the Selection Tree.

Selecting the NE-1 entity in the Selection Tree provides the SyncJack Global Dashboard View (see Figure 209 on p. 344). The Global status reflects a composite of 3 status meters: Clock Accuracy, Clock Analysis and PTP Network Analysis. For the indicator bar, a horizontal line indicates N/A, green indicates normal operation, yellow indicates some issue exists, red indicates a significant problem.

Figure 209: SyncJack Network Element View



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SP-100 Probing Features

General Guideline for Reference Accuracy Used by the Probes

In order to measure meaningful results, the accuracy of the reference used by the probes should be accurate by at least one order of magnitude compared to the signal under test; i.e., when using GPS as a reference, the time error generated by the GPS/GNSS receiver/PRTC can be up to 100 +/- nsec (according to G.8272) - therefore, the TE/ TIE/MTIE can be effected by the GPS reference time error and wander.

Clock Accuracy

- Up to 2 Clock Probes:
  - Calculate MTIE between physical source and reference signals
  - Programmable Source and reference signals

Note

Only one Clock Probe can be created if TimeClock is configured with TimeReference as GPS.

Clock Analysis

- Up to 4 PTP Clock Probes (all PTP Clock Probes must use the same reference).
  - Calculate packet MTIE between Physical reference signal and packet flow
  - Probe Master to Slave or Slave to master traffic
  - Support parallel and tapping modes
- T-SC score – simple score of internal slave clock

PTP Network Analysis

- 1 PTP Network Probe
  - Delay and delay variation performance statistics
  - Network usability statistics
  - Packet loss statistics

MTIE Comparison

- Compare up to four MTIE results

Raw Data Collection

- Set up a Raw Data Collection Server

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- Enable Raw Data Collection for Clock Probe (Clock Accuracy), PTP Clock Probe (Clock Analysis) results

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Provision Raw Data Collection Server

Perform the following procedure if using a raw data collection server is to be used for receiving Clock Accuracy and/or Clock Analysis results for further calculations.

The procedure for provisioning the raw data collection server assumes that the System configuration is properly configured to enable the desired file transfer protocol to be used. See “Configure System Identity and Configuration” on p. 162.

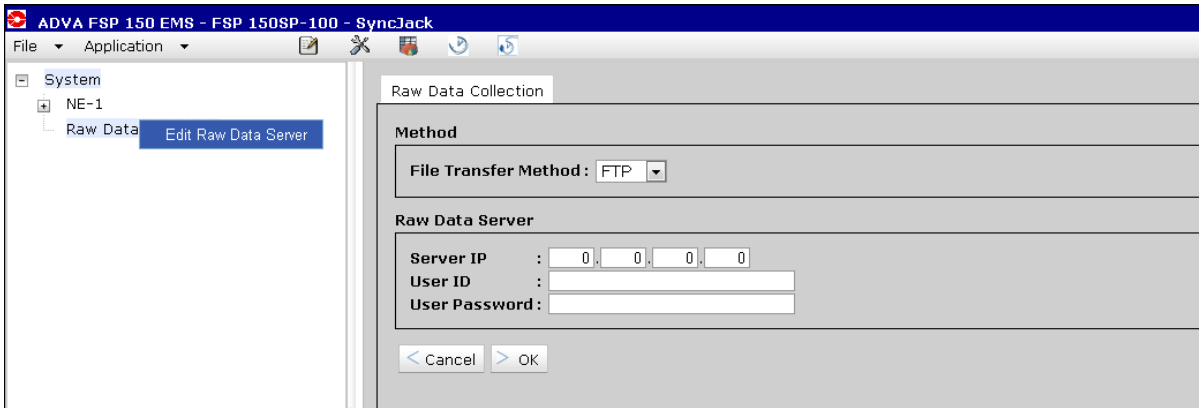
Procedure

Step 1 Select the SyncJack icon or select **SyncJack** from the Applications menu, then expand the System folder in the selection tree.

Step 2 Enter a right click on Raw Data Collection in the selection tree and select Edit Raw Data Server.

A Raw Data Collection pane appears

Figure 210: Edit Raw Data Server



Step 3 Enter the following to configure the Clock Probe:

File Transfer Method - select the desired File Transfer Method

Server IP - enter the server IP address

User ID - enter the server User ID

User Password - enter the server User Password

Select **OK**.

Note

The desired File Transfer Method to be used must be enabled in the System configuration. See “Configure System Identity and Configuration” on p. 162.

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Step 4 Select Raw Data Collection in the selection tree to verify entry.

End of Procedure

Performing Clock Accuracy Testing

SP-100 Clock Accuracy testing uses a user selected reference clock and a source clock and measures the difference between them. The output of the measurement is expressed as:

TIE, where: TIE[n] =ref[n] - src[n]

and

MTIE: Constant difference between the clocks is rejected, so only the frequency differences matter.

The procedure for performing Clock Accuracy testing assumes that SP-100 is properly connected to the clock inputs to be measured and the appropriate SP-100 interfaces have been configured. See “Provisioning the SP-100” on p. 153.

Procedure

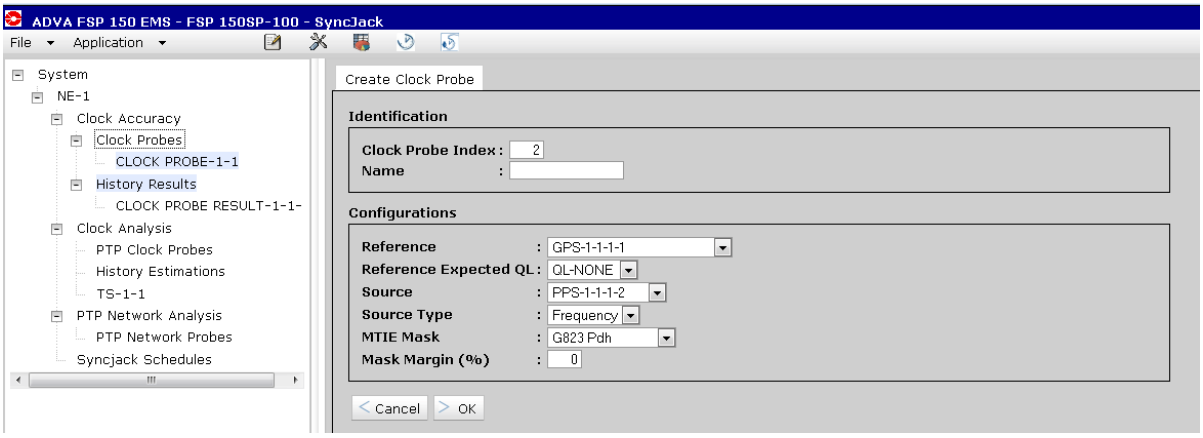
Step 1 Select the SyncJack icon or select **SyncJack** from the Applications menu, then expand the System folder in the selection tree.

Step 2 Expand the Network Element entity from the selection tree, then expand the Clock Accuracy entity.

Step 3 Enter a right click on Clock Probes in the selection tree and select Create Clock Probe.

A Create Clock Probe pane appears

Figure 211: Create Clock Probe View



Step 4 Enter the following to configure the Clock Probe:

Clock Probe Index - EID for the probe. Enter a number from 1 to 9.

Name - a text identifier (up to 15 characters, no spaces or special

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characters) for the probe. (Required entry.)

Reference – the signal reference for this Clock Probe. The available references are populated in a drop-down list.

Reference Expected QL - clock quality level of the selected reference. The available QLs are provided in a drop-down list.

Source – select the desired source (clock under test) from the drop-down list.

Source Type - select either Frequency or Phase from the drop-down list.

MTIE Mask – select the desired MTIE Mask from the drop-down list.

Mask Margin - enter the desired Mask Margin as a percentage from 0 to 99

Raw Data Collection - If Raw Data Collection Server has been provisioned: enable or disable raw data to be sent to a remote raw data collection server

Measurement Type - select the measurement type (Frequency or Phase)

Select **OK**.

Step 5 Expand “Clock Probes” in the Selection Tree.

The newly created Clock Probe entity is displayed

Step 6 Select the Clock Probe entity and Status tab to verify entry and connection status (see Figure 212 on p. 350). If any Failures are indicated, troubleshoot and clear the failure as necessary.

Note

A Clock Probe can be edited after creation by right clicking on the entity name and selecting ‘Edit Clock Probe’. All fields except the Clock Probe Index can be edited. Once a probe is scheduled it cannot be modified or deleted.

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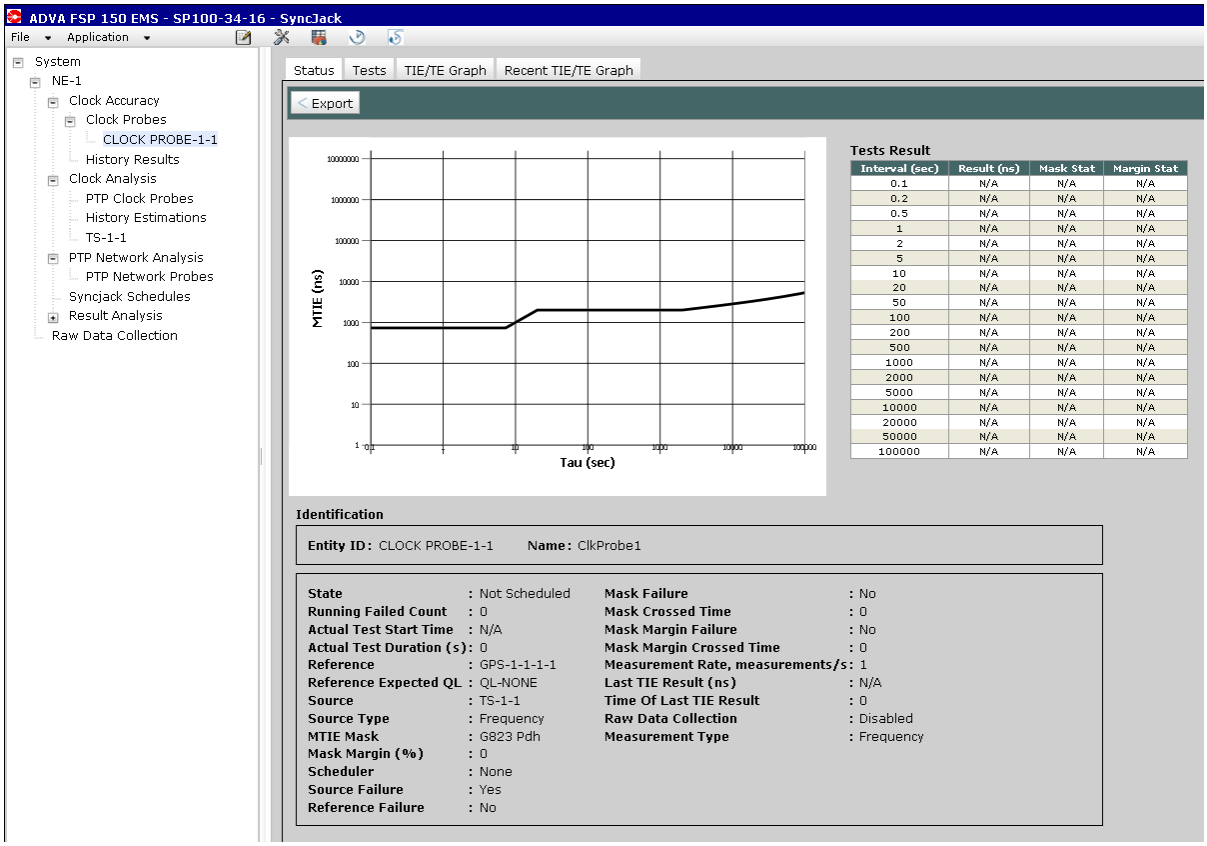
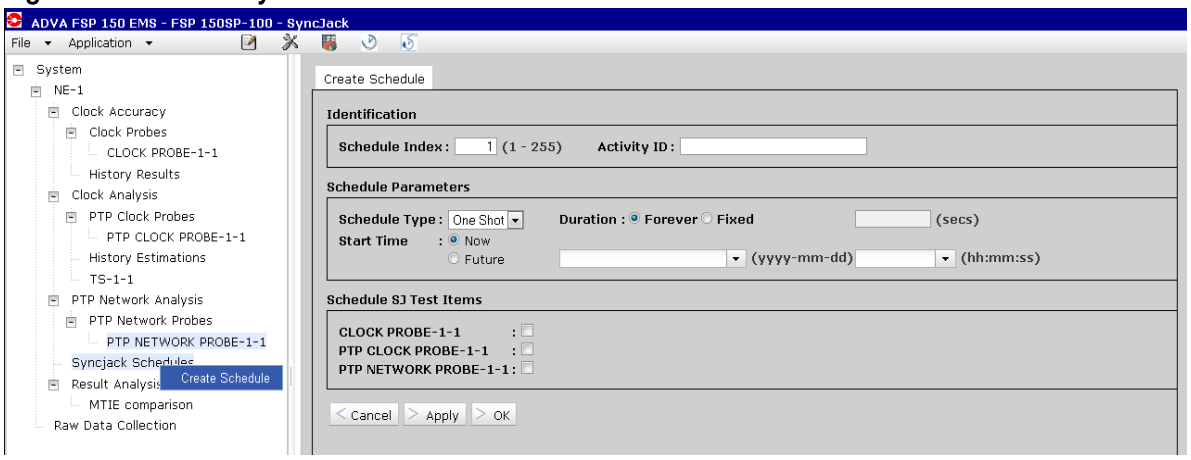
Figure 212: Clock Probe Status Tab



Step 7 Enter a right click on SyncJack Schedules in the selection tree and select Create Schedule.

A Create Schedule pane appears

Figure 213: Create SyncJack Schedule



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Step 8 Enter the following to configure the SyncJack Schedule:

Schedule Index – EID for the schedule. Enter a number from 1 to 255.

Activity ID – a text identifier (up to 15 characters, no spaces or special characters) for the probe.

Schedule Type – Select the desired type from the drop-down list. (Only 'One Shot' is currently supported)

Duration - Select either the 'Forever' or 'Fixed' radio button. If 'Fixed' is selected, enter the desired duration in seconds.

Start Time – select 'Now' or 'Future' radio button. If 'Future' is selected, enter the date and time for the test to start.

Schedule SJ Test Items - select the desired Clock Probe(s) for this test from the list provided by clicking the related check box(es).

Select **OK**.

Step 9 Expand "Syncjack Schedules" in the Selection Tree.

A new Syncjack Schedule entity is present

Step 10 Select the Syncjack Schedule entity to verify entry.

Step 11 Select the desired Clock Probe entity/entities in the Selection Tree and the Status tab to observe the Syncjack Schedule State and test progress (State indicates whether the test is Not Scheduled, Failed, Waiting [Scheduled - Future], Running or Completed).

A Clock Probe Status pane displays

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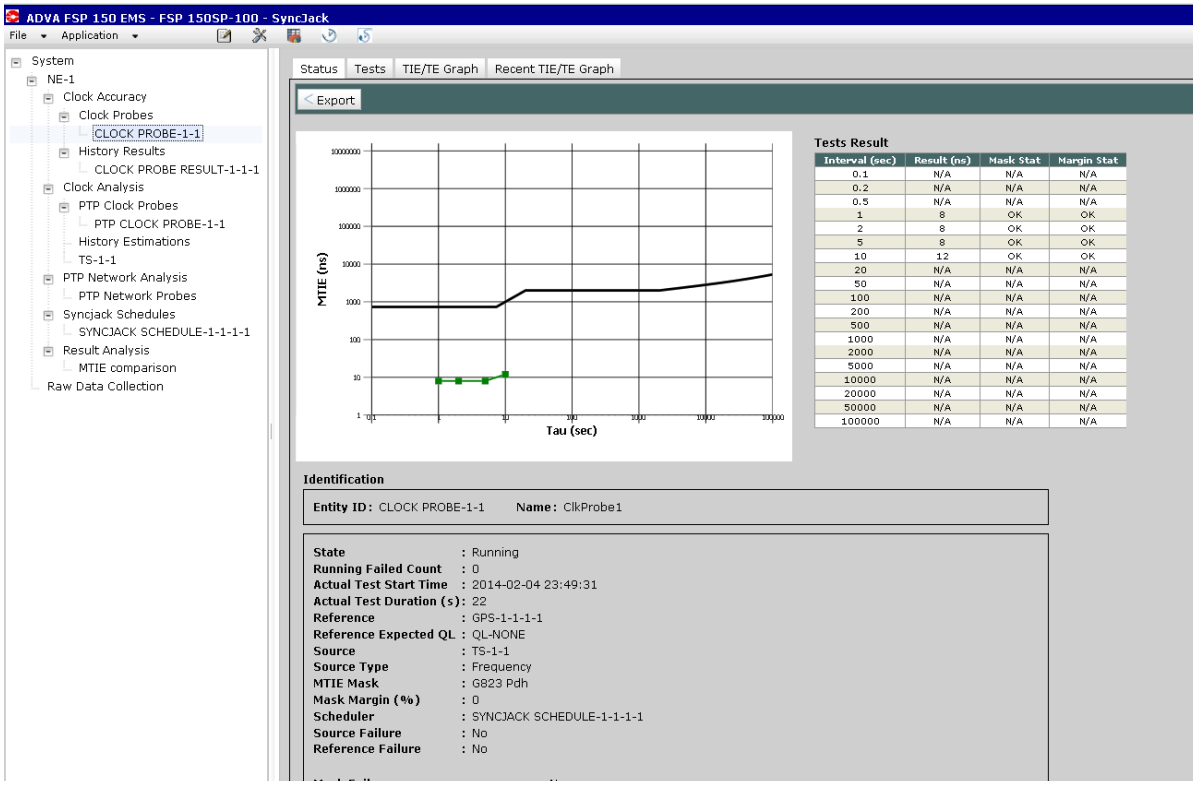
Figure 214: View Clock Probe State - Running



Step 12 Click on the PTP Clock Probe entity again to observe continued progress while the test is running. Observe the Actual Test Duration (s) status to determine how long the test has been running / how much time is left before completion (if a Fixed Duration was scheduled).

Step 13 Click on the PTP Clock Probe entity again to observe when the test is completed (see the following figure).

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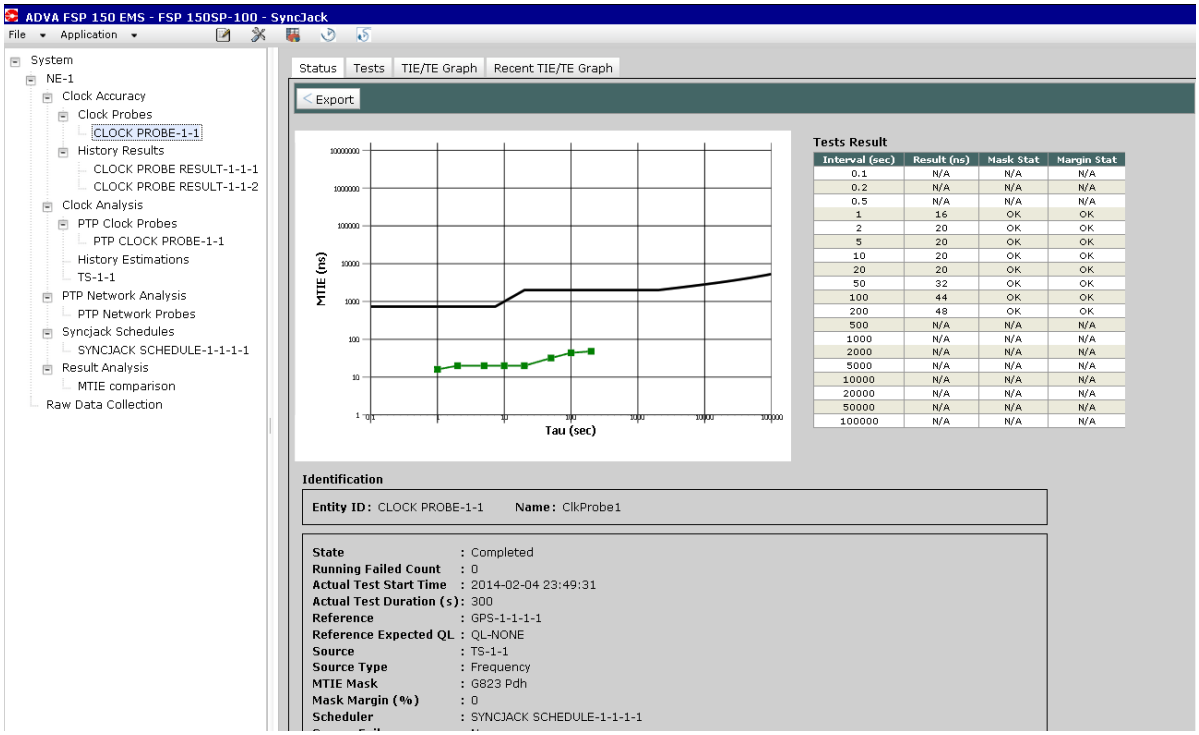
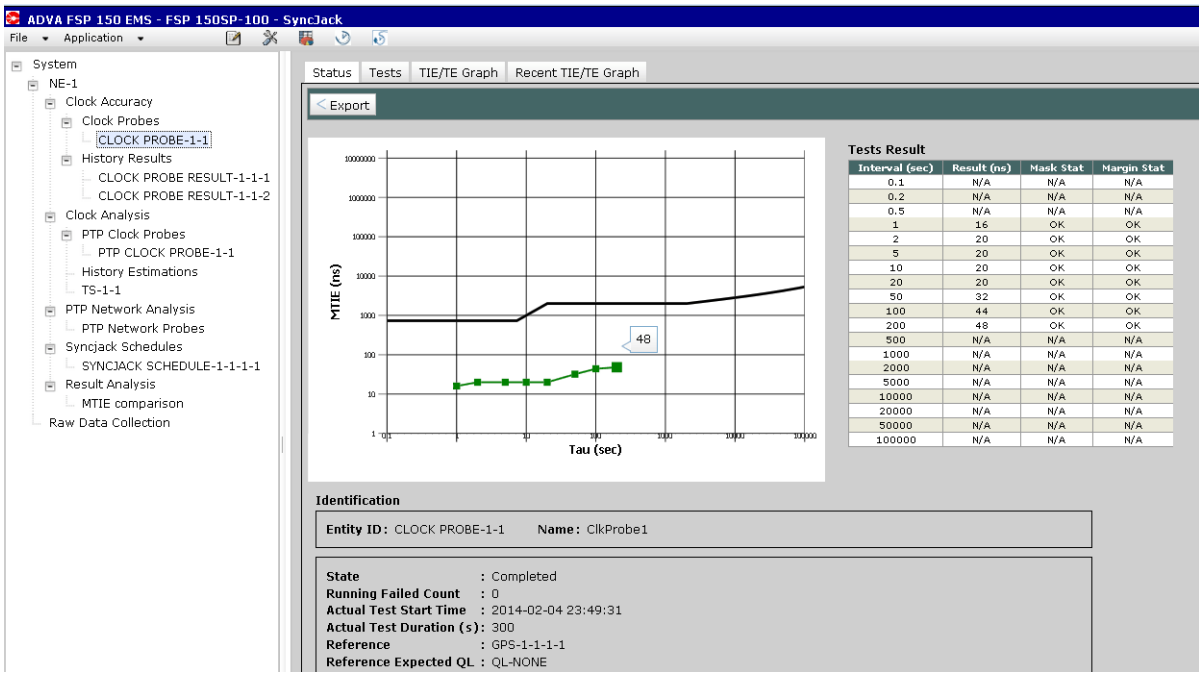
Figure 215: View Clock Probe State - Completed



Step 14 Observe test result details by interval by viewing the Test Result table or hovering the mouse over the interval marker in the graph (see the following figure).

Figure 216: View Clock Probe Test Result Details



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Step 15 Test results may be exported to Microsoft Excel or other program by selecting the Export button (see the next two figures).

Figure 217: Exporting Clock Probe Test Results to Excel

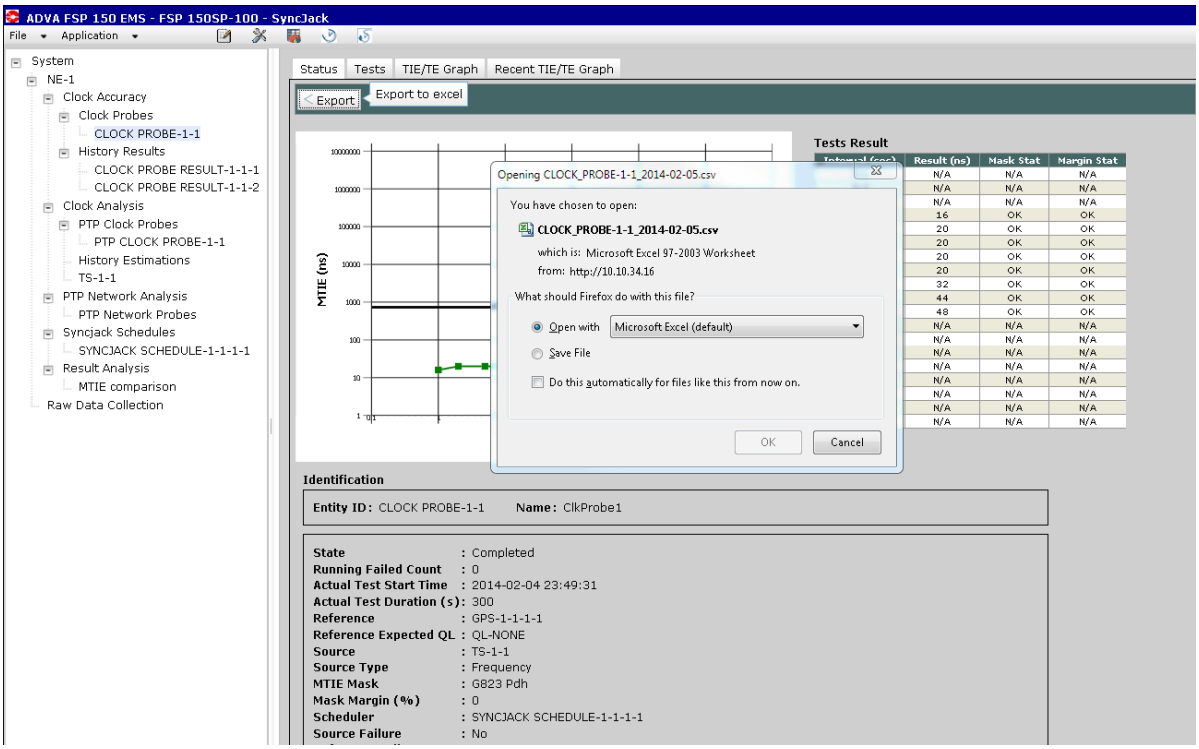

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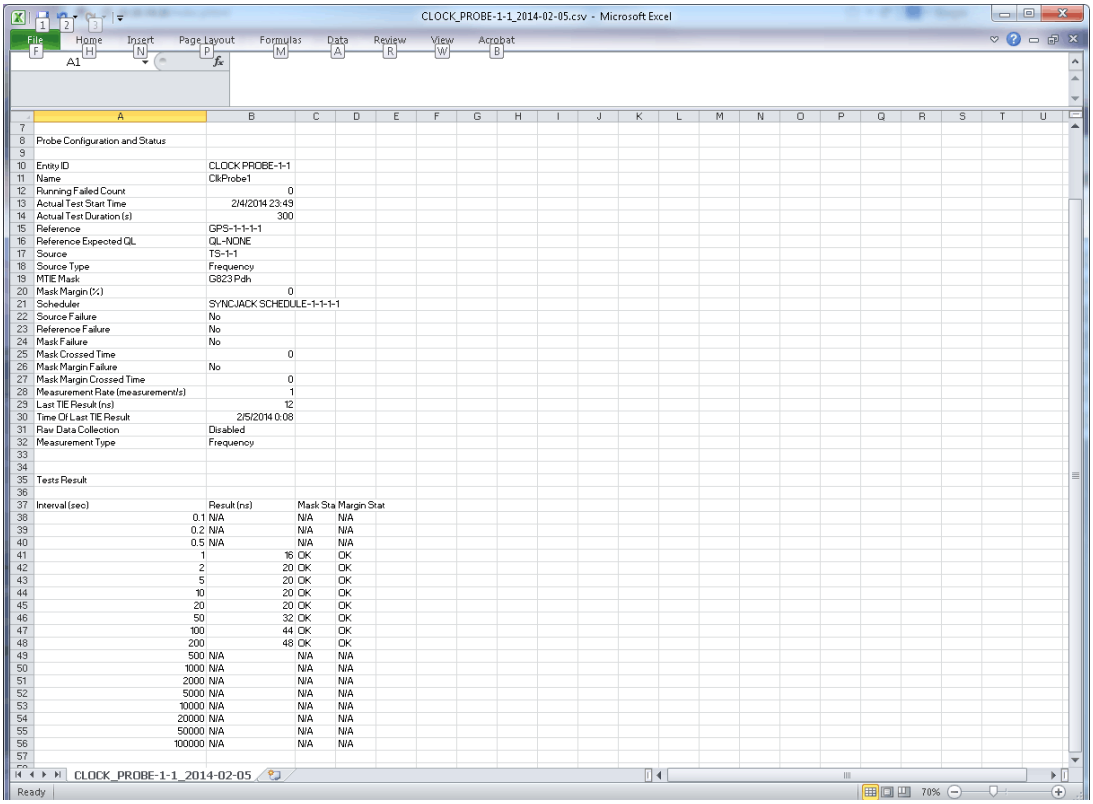
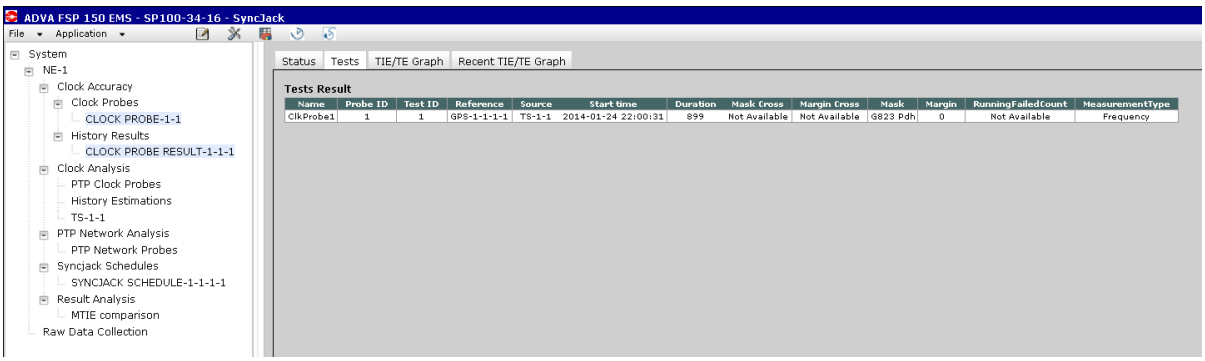
Figure 218: Clock Probe Test Results in Excel



Step 16 After the test is completed, select the Tests tab to view test results in tabular format. Scroll over to determine if any thresholds have been crossed.

Figure 219: Clock Probe Result Tests Tab



Step 17 Select the TIE Graph tab.

Test results are provided in a TIE Graph

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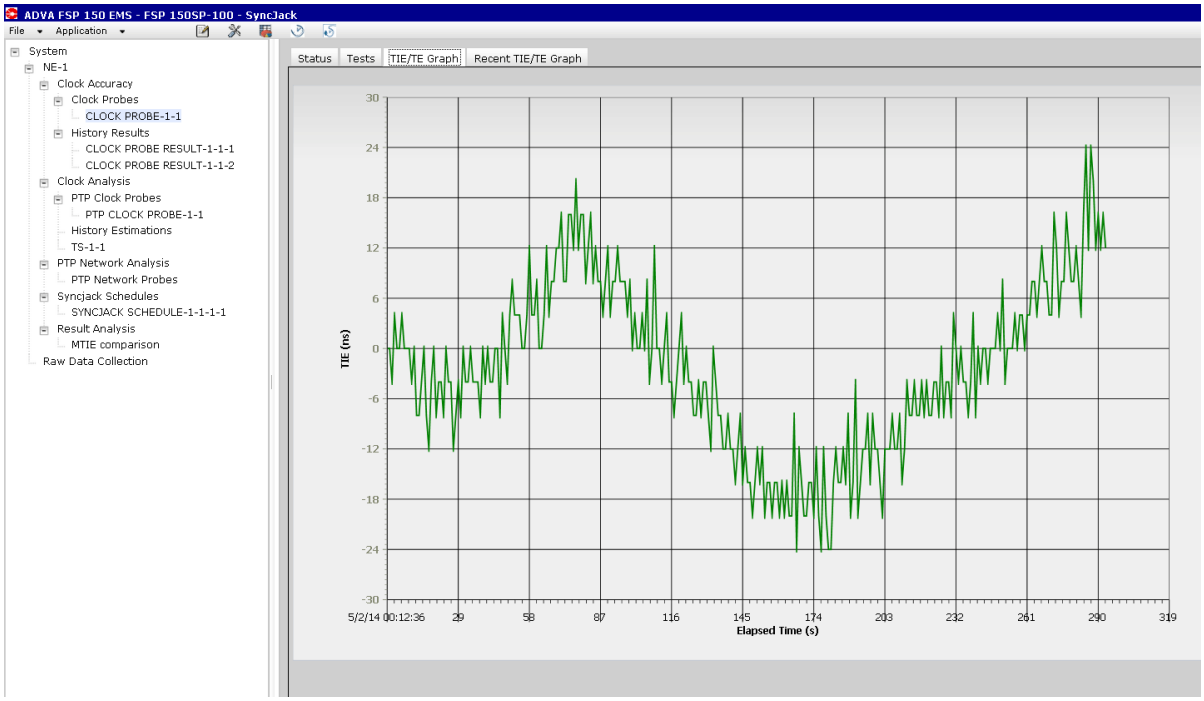
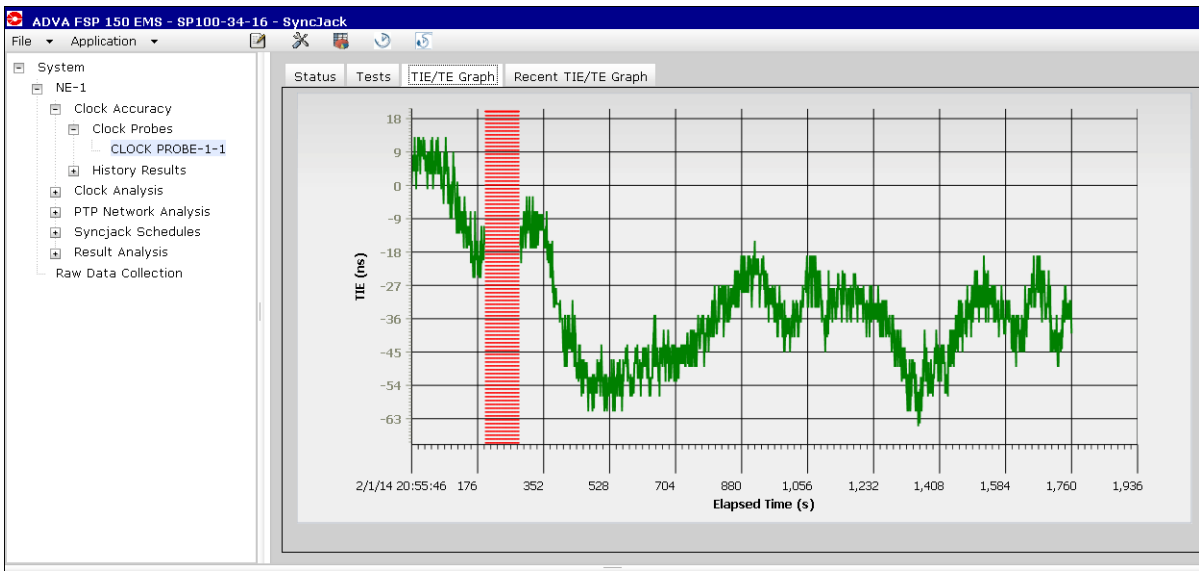
Figure 220: Clock Probe Result in TIE Graph



Note

If a source or reference failure occurs and eventually recovers during the Syncjack scheduled window, the failed region is indicated by a red shadowed area of the TIE/TE graph (see example in the following figure).

Figure 221: Example Clock Probe TIE/TE Graph with Failed Region



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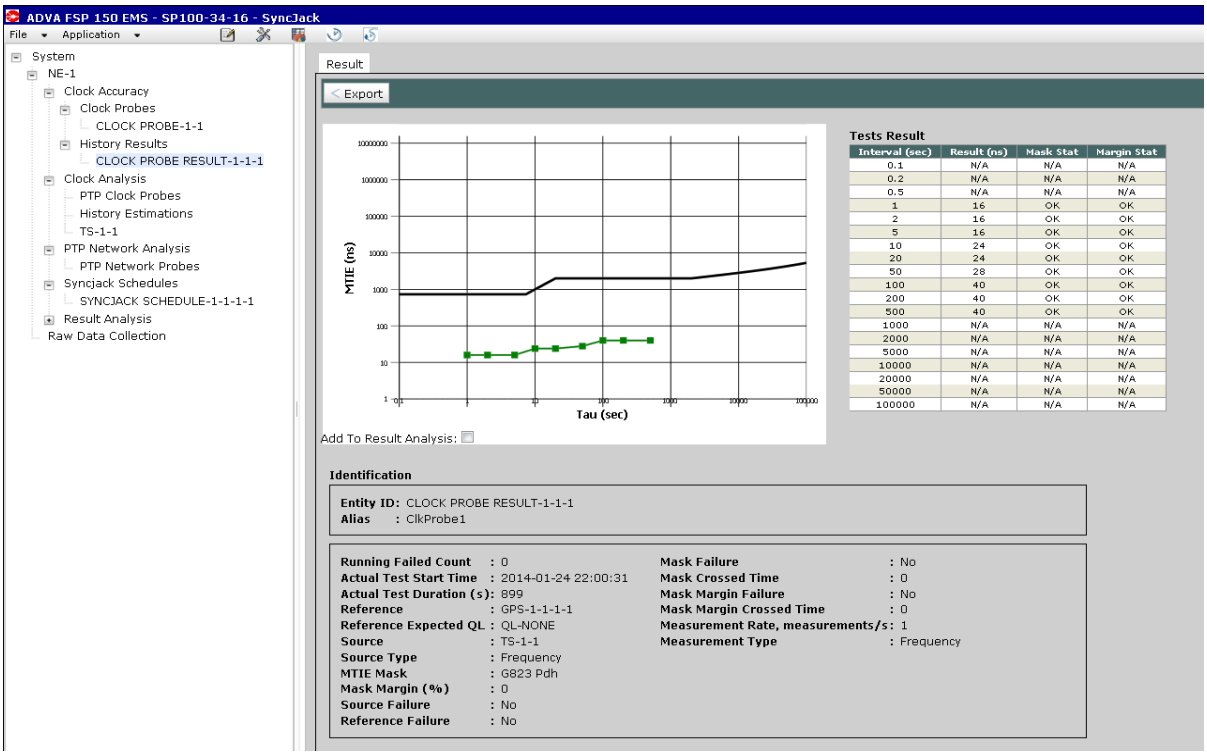
Step 18 Select the Recent TIE Graph tab to view the last 2000 seconds of test results.

Step 19 After the test is completed, a subset of the Clock Probe Status Tab data are available in a history entity. To view history results, expand the History Results entity under the Clock Probe entity and select the desired Clock Probe Result(s) to view.

A Clock Probe History Result pane displays

Figure 222: View Clock Probe History Result



Step 20 History Test results may be exported to Microsoft Excel or other program by selecting the Export button.

Step 21 Select the Clock Accuracy entity in the Selection Tree to view the Clock Accuracy results via Dashboard meter. If two Clock Probes have been scheduled (as shown below) the results of both Clock Probes are displayed.

Note

The Clock Accuracy meter will display test results only if the associated SyncJack schedule is present. Each Probe is associated with a color coded radio button according to its test result (green, yellow or red). If gray, this indicates the SyncJack schedule has been deleted.

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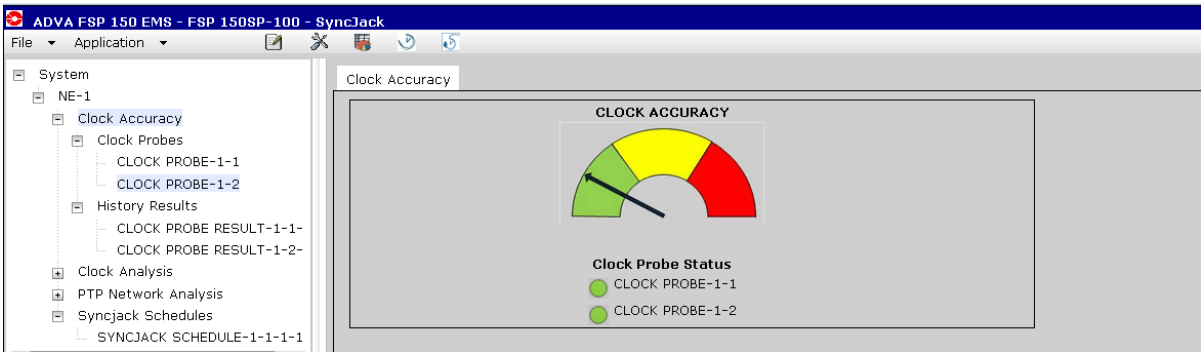
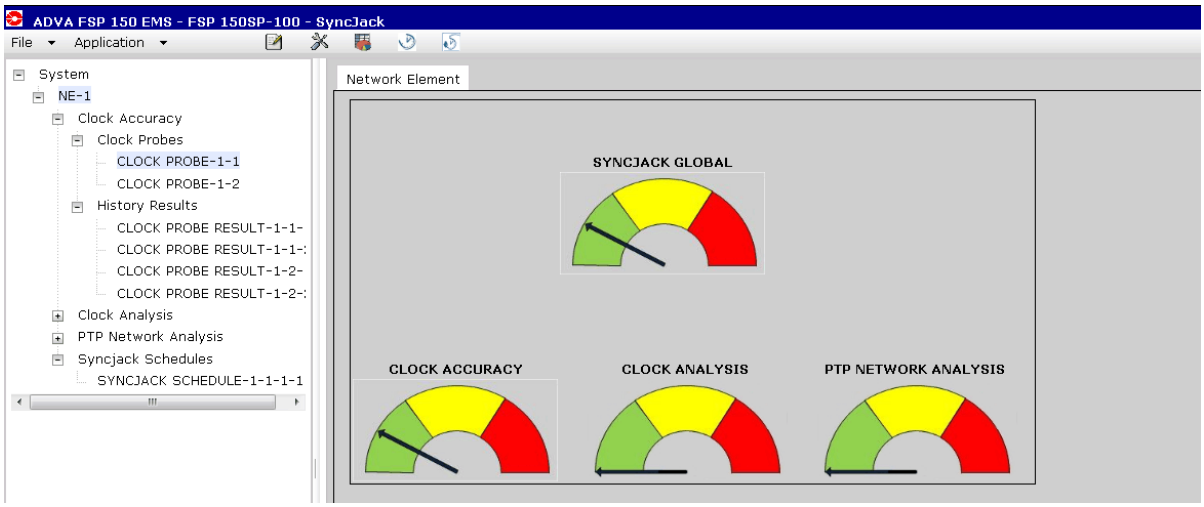
Figure 223: View Clock Accuracy Result Meter



Step 22 Select the Network Element entity in the Selection Tree to view the Clock Accuracy and Global results via Dashboard meter.

Figure 224: View Global and Clock Accuracy Dashboard



Step 23 To delete a SyncJack Schedule, right click on the desired schedule under ‘SyncJack Schedules’ and select ‘Delete Schedule’.

A Delete SyncJack Schedule pane appears

Select **OK**.

Step 24 To delete a Clock Probe History Result, right click on the desired result under ‘History Results’ and select ‘Delete History Result’.

A confirmation screen appears

Select **OK**.

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Step 25 To delete a SyncJack Clock Probe, right click on the desired probe and select ‘Delete Clock Probe’.

A Delete Clock Probe pane appears

Select **OK**.

End of Procedure

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Performing Clock Analysis

SyncJack Clock Analysis measures the quality of timestamps generated by the clock under test. The procedure for performing Clock Analysis assumes that SP-100 is properly connected to the clock inputs to be measured and the appropriate SP-100 interfaces have been configured. See “Provisioning the SP-100” on p. 153.

Note

The Slave clock under test must populate the origin timestamp t3 in Delay_Req messages in order to allow monitoring.

Note

This procedure requires a PTP FlowPoint. To create one, see “Provision Precision Time Protocol (PTP)” on p. 208.

Procedure

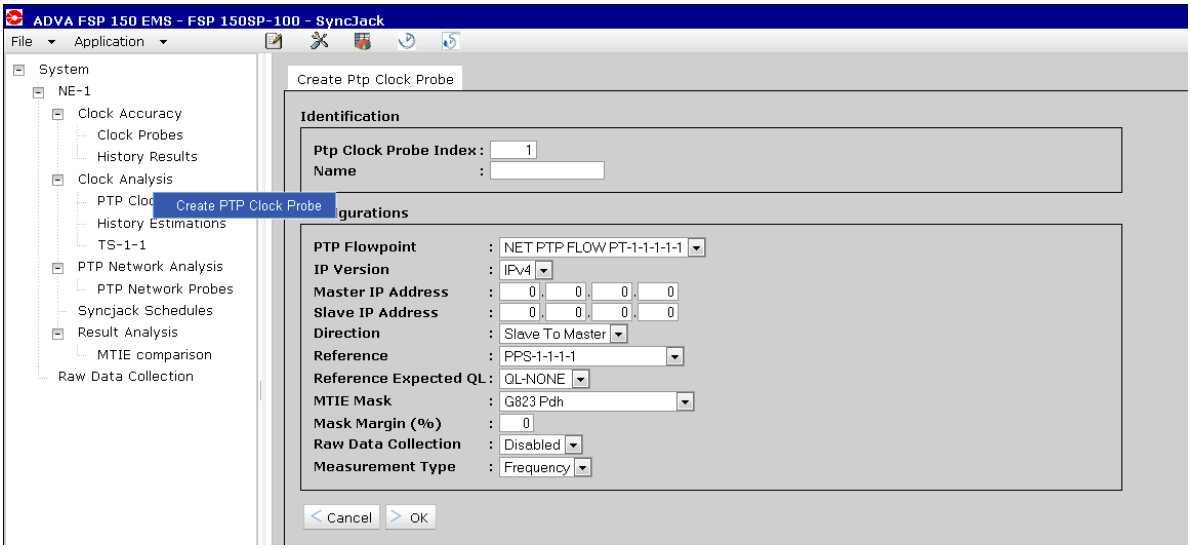
Step 1 Select the SyncJack icon or select **SyncJack** from the Applications menu, then expand the System folder in the selection tree.

Step 2 Expand the Network Element entity from the selection tree, then expand the Clock Analysis entity.

Step 3 Enter a right click on PTP Clock Probes in the selection tree and select Create Clock Probe.

A Create PTP Clock Probe pane appears

Figure 225: Create PTP Clock Probe View



Step 4 Enter the following to configure the Clock Probe:

Clock Probe Index - EID for the probe. Enter a number from 1 to 4.

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(Create only)

Name – a text identifier (up to 15 characters, no spaces or special characters) for the probe. (Required entry.)

PTP Flowpoint - select the PTP Flowpoint from the drop-down list.

IP Version - select the desired IP version from the drop-down list. (Only 'IPv4' is supported version for the current release.)

Master IP Address - enter the IP address of the master clock (if the PTP Flow Point Type is set to OC Slave, then the Master IP Address must be configured the same as the SOOC).

Slave IP Address - enter the IP address of the slave clock (if the PTP Flow Point Type is set to OC Slave, then the Slave IP Address must be configured the same as the SOOC).

Direction - select the desired Direction (Slave to Master or Master to Slave). If the Flow Point Type of the associated PTP Flow Point is set to OC Slave, then Slave to Master or Master to Slave may be selected. If the Flow Point Type of the associated PTP Flow Point is set to OC Master, then only Slave to Master selection is allowed.

Reference – the signal reference for this Clock Probe. The available references are populated in a drop-down list.

Reference Expected QL - clock quality level of the selected reference. The available QLs are provided in a drop-down list.

MTIE Mask – select the desired MTIE Mask from the drop-down list.

Mask Margin - enter the desired Mask Margin as a percentage from 0 to 99

Raw Data Collection - If Raw Data Collection Server has been provisioned: enable or disable raw data to be sent to a remote raw data collection server

Measurement Type - select the measurement type (Frequency or Phase)

Select **OK**.

Step 5 Expand "PTP Clock Probes" in the Selection Tree.

The newly created PTP Clock Probe entity is present

Step 6 Select the newly created PTP Clock Probe entity to verify entry and connection status (see Figure 226 on p. 362). If any Failures are indicated, troubleshoot and clear the failure as necessary.

Note

All PTP Clock Probes must use the same reference.

Note

A PTP Clock Probe can be edited after creation by right clicking on the entity name and selecting 'Edit PTP Clock Probe'. All fields except the PTP Clock Probe Index can be edited. Once a probe is scheduled it cannot be modified or deleted.

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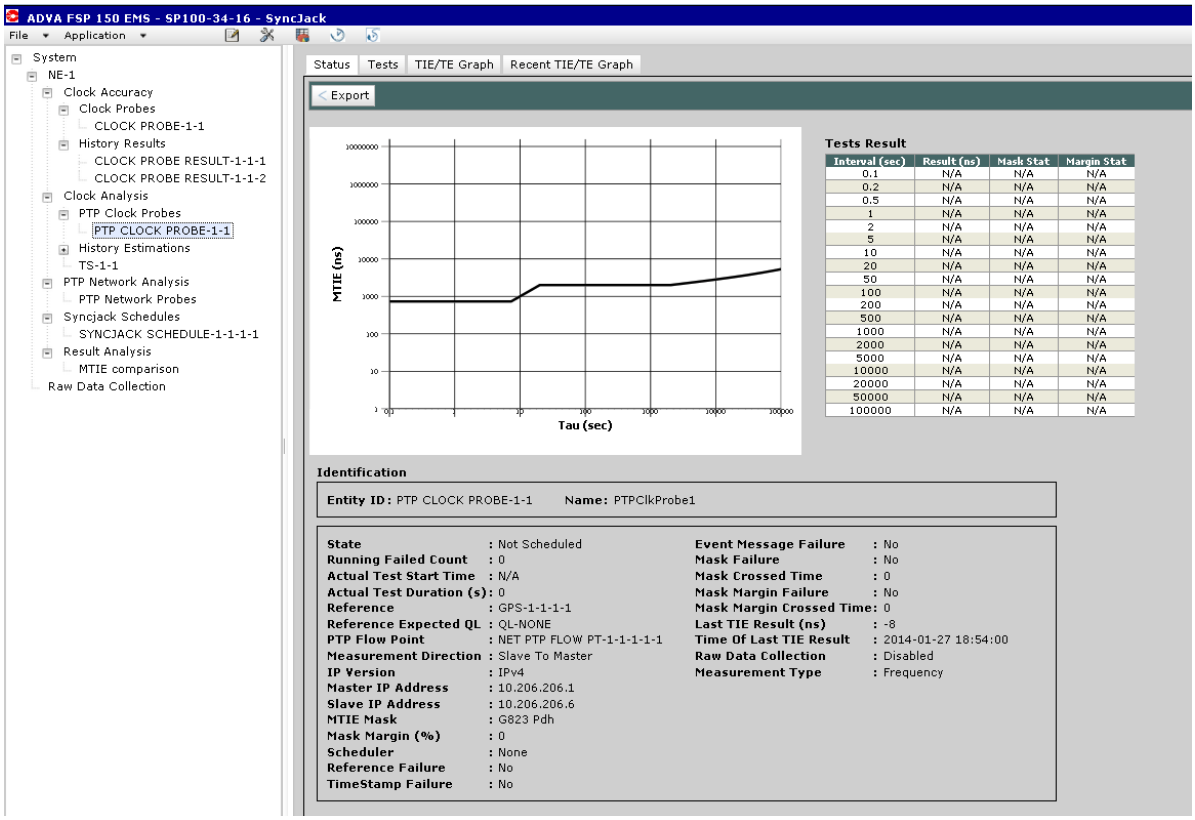
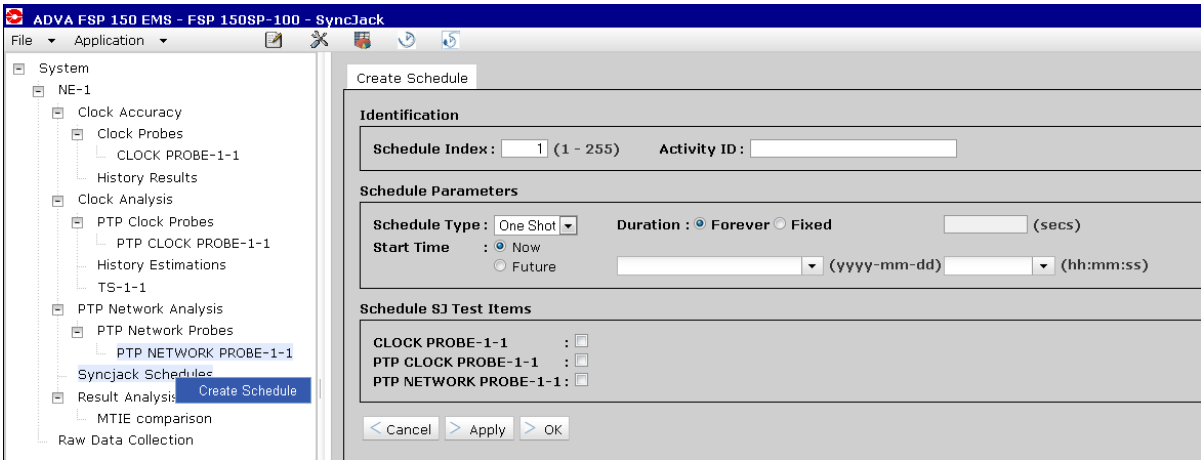
Figure 226: PTP Clock Probe Status Tab



Step 7 Enter a right click on SyncJack Schedules in the selection tree and select Create Schedule.

A Create Schedule pane appears

Figure 227: Create SyncJack Schedule



Step 8 Enter the following to configure the SyncJack Schedule:

Schedule Index - EID for the schedule. Enter a number from 1 to 255.

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Activity ID – a text identifier (up to 15 characters, no spaces or special characters) for the probe.

Schedule Type – Select the desired type from the drop-down list. (Only 'One Shot' is currently supported)

Duration - Select either the 'Forever' or 'Fixed' radio button. If 'Fixed' is selected, enter the desired duration in seconds.

Start Time – select 'Now' or 'Future' radio button. If 'Future' is selected, enter the date and time for the test to start.

Schedule SJ Test Items - select the desired Probe(s) for this test from the list provided by clicking the related check box(es).

Select **OK**.

Step 9 Expand "Syncjack Schedules" in the Selection Tree.

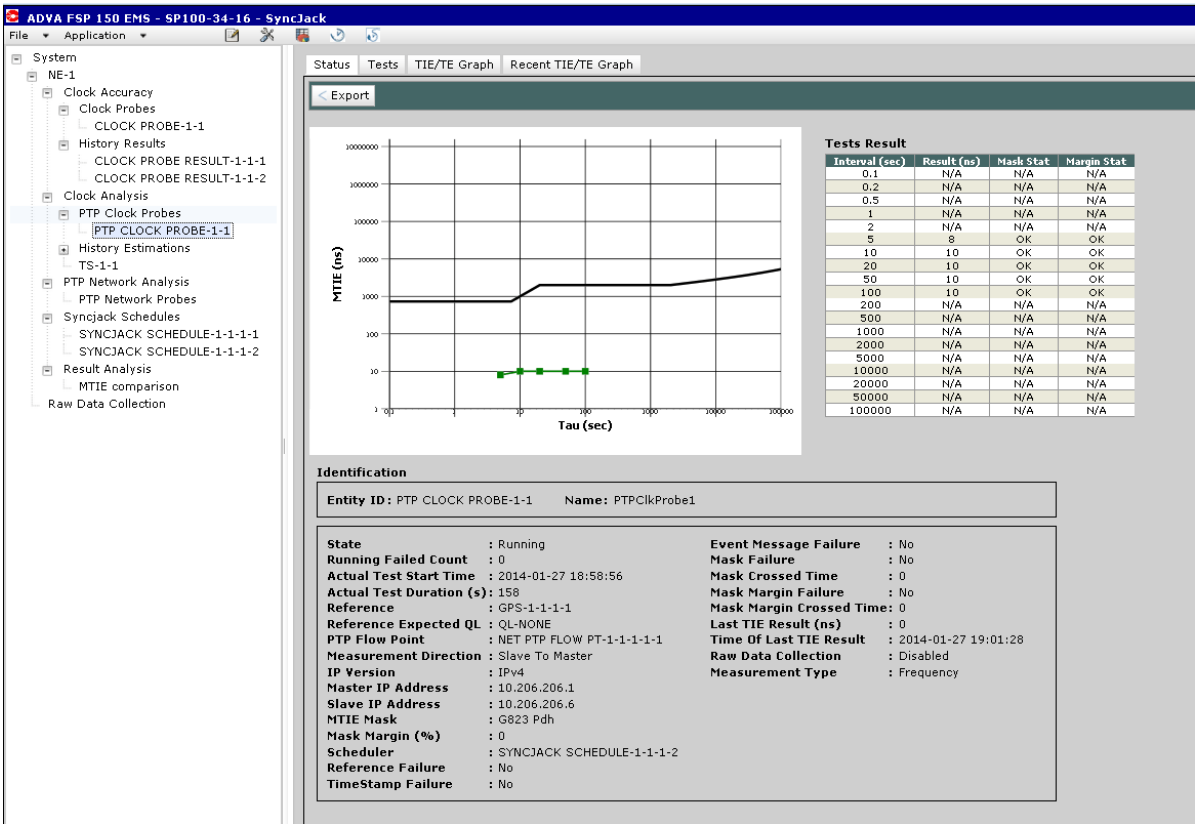
A new Syncjack Schedule entity is present

Step 10 Select the Syncjack Schedule entity to verify entry.

Step 11 Select the desired PTP Clock Probe entity in the Selection Tree to observe the SyncJack Schedule State and test progress (State indicates whether the test is Not Scheduled, Failed, Waiting [Scheduled - Future], Running or Completed).

A PTP Clock Probe Status pane displays

Figure 228: PTP Clock Probe State - Running



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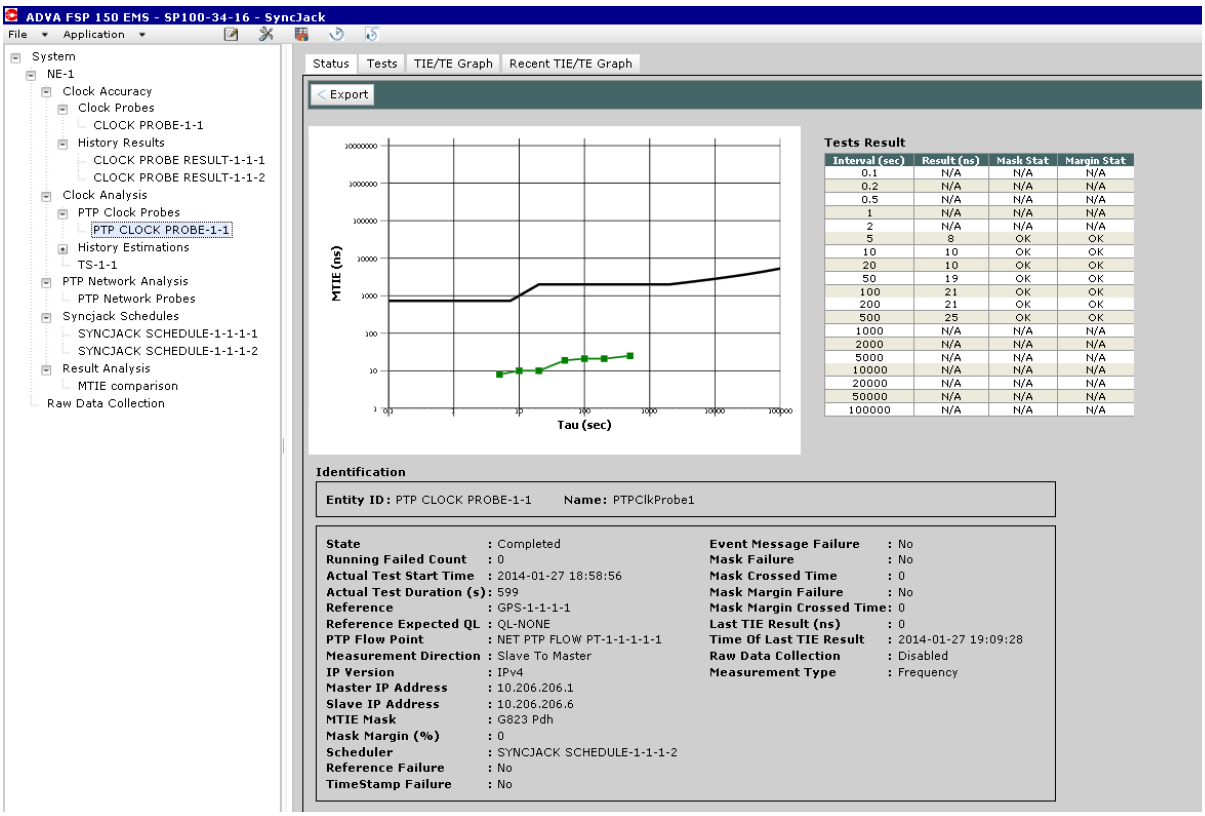
Step 12 Click on the PTP Clock Probe entity again to observe continued progress while the test is running. Observe the Actual Test Duration (s) status to determine how long the test has been running / how much time is left before completion (if a Fixed Duration was scheduled).

Step 13 Click on the PTP Clock Probe entity again to observe when the test is completed (see the following figure).

Figure 229: PTP Clock Probe State - Completed



Step 14 Observe test result details by interval by viewing the Test Result table or hovering the mouse over the interval marker in the graph (see Figure 216 on p. 353 for an example).

Step 15 Test results may be exported to Microsoft Excel or other program by selecting the Export button (see the following figure). (Excel output is similar to what is shown in Figure 218 on p. 355.)

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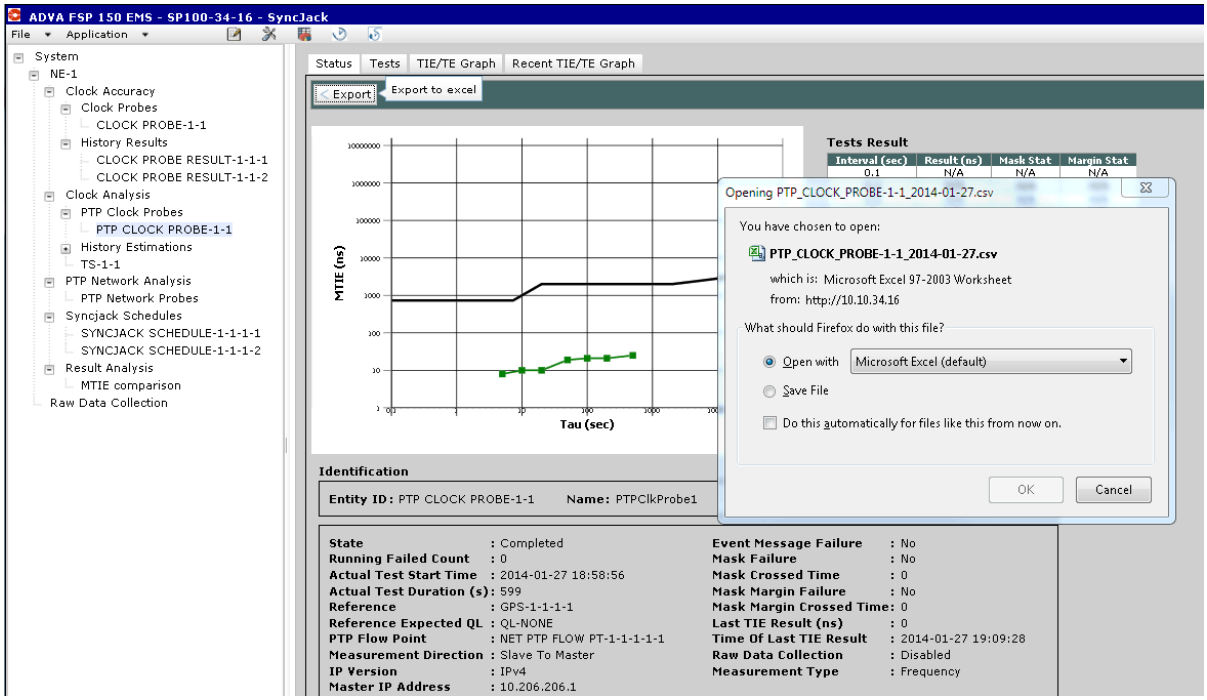
Figure 230: Exporting PTP Clock Probe Test Results to Excel



Step 16 After the test is completed, select the Tests tab to view test results in tabular format. Scroll over to determine if any thresholds have been crossed.

Step 17 Select the TIE Graph tab.

Test results are provided in a TIE Graph

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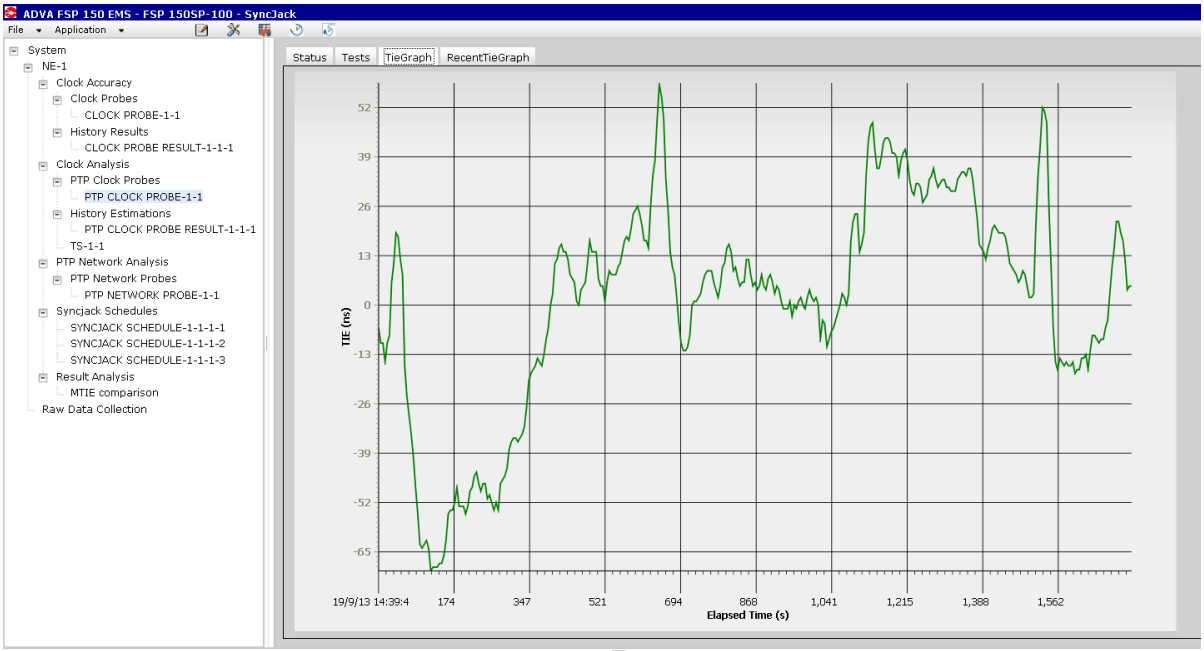
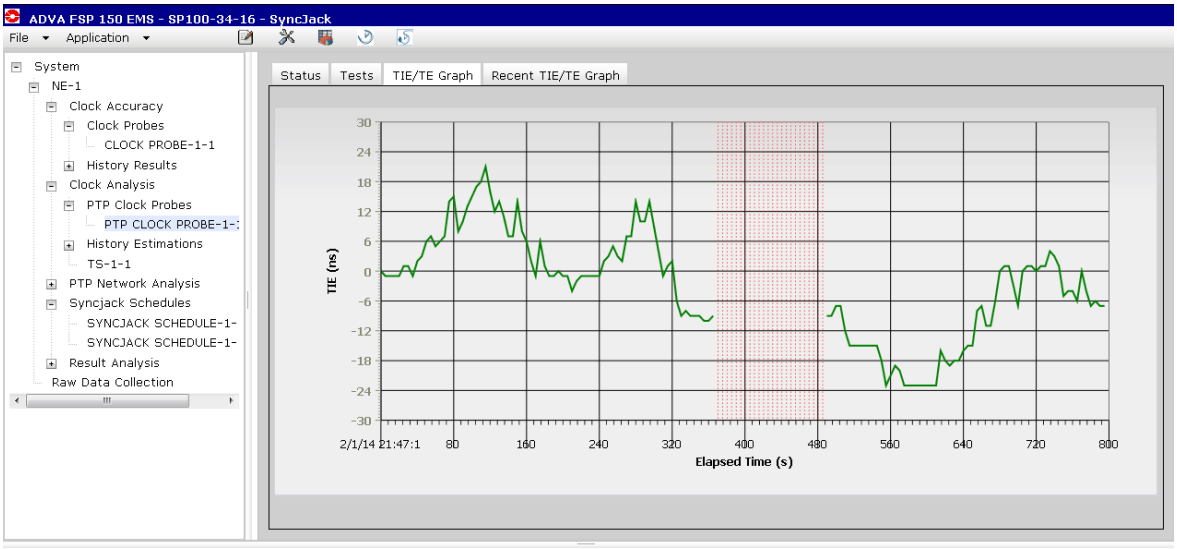
Figure 231: SyncJack PTP Clock Probe Result in TIE Graph



Note

If a source or reference failure occurs and eventually recovers during the Syncjack scheduled window, the failed region is indicated by a red shadowed area of the TIE/TE graph (see example in the following figure).

Figure 232: Example PTP Clock Probe TIE/TE Graph with Failed Region



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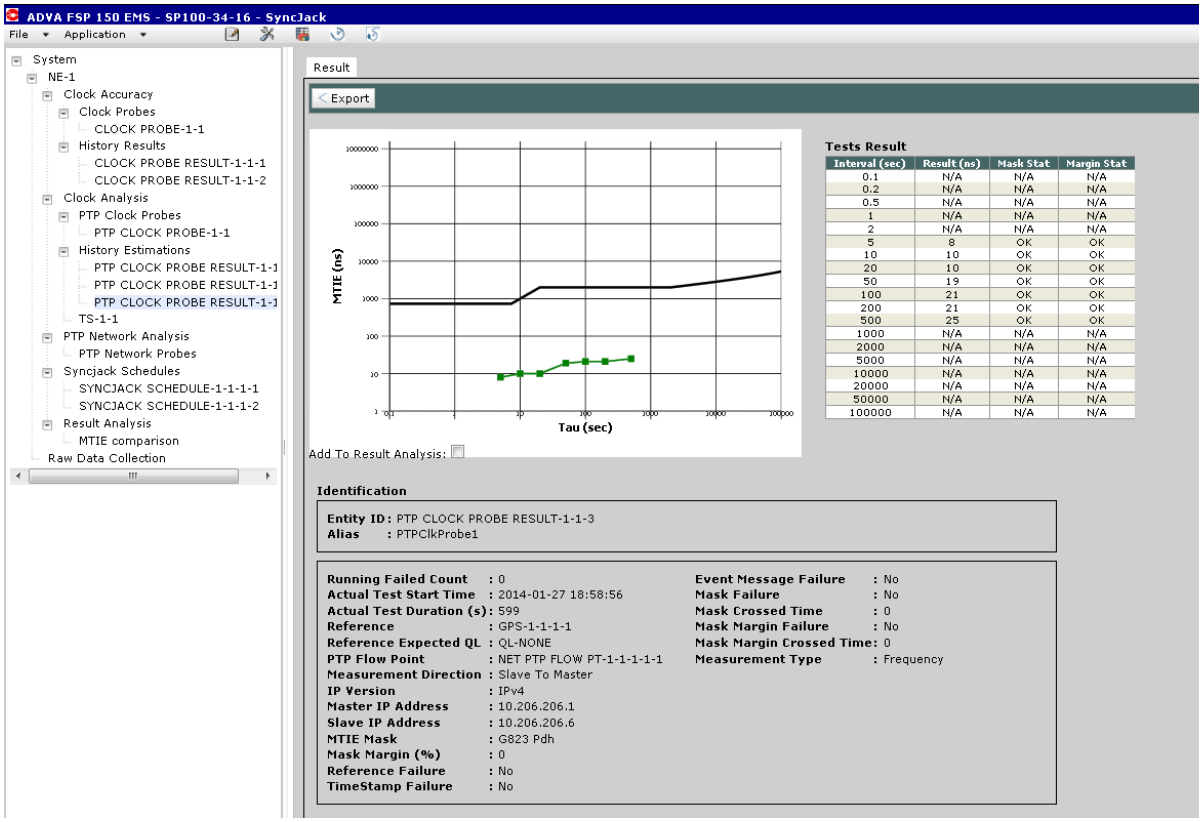
Step 18 If the test duration is longer than 2000 seconds, select the Recent TIE Graph tab to view the last 2000 seconds of test results.

Step 19 After the test is completed, a subset of the PTP Clock Probe Status Tab data are available in a history entity. To view history results, expand the History Results entity under the PTP Clock Probe entity and select the desired PTP Clock Probe Result(s) to view.

A PTP Clock Probe History Result pane appears

Figure 233: View PTP Clock Probe History Result



Step 20 Test results may be exported to Microsoft Excel or other program by selecting the Export button.

Step 21 Select the Clock Analysis entity in the Selection Tree to view the Clock Analysis results via Dashboard meter. If two Clock Probes have been scheduled (as shown below) the results of both Clock Probes are displayed.

Note

The Clock Analysis meter will display test results only if the associated SyncJack schedule is present. Each result is associated with a color coded radio button according to its Probe/Score (green, yellow or red). If gray, this indicates the SyncJack schedule has been deleted or no score results are present.

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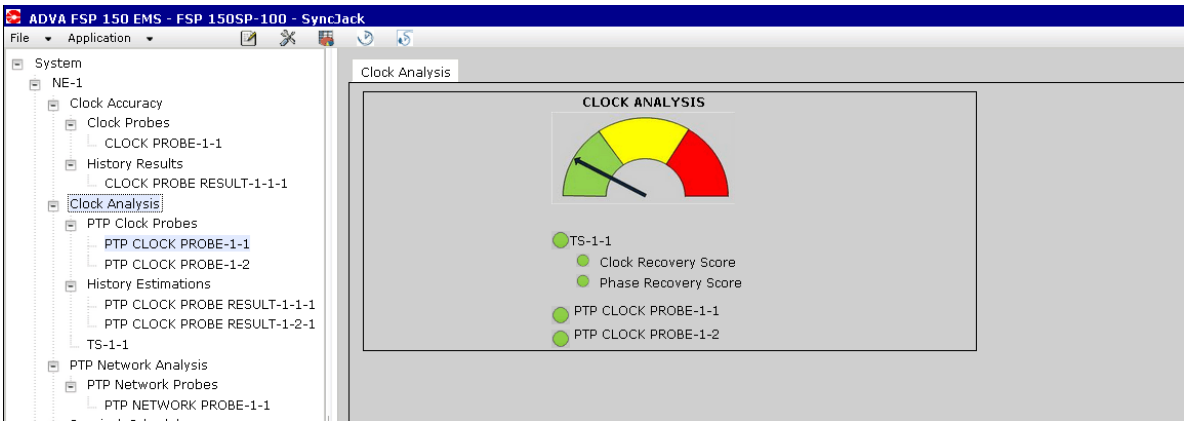
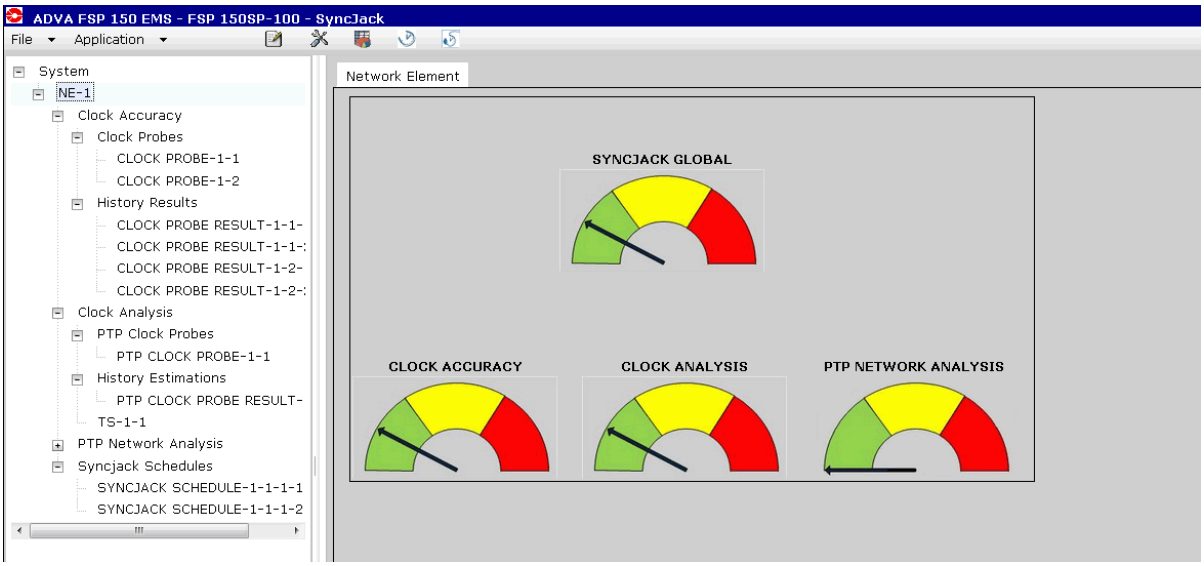
Figure 234: View Clock Analysis Result Meter



Step 22 Select the Network Element entity in the Selection Tree to view the Clock Analysis and Global results via Dashboard meter.

Figure 235: View Global and Clock Analysis Dashboard



Step 23 To delete a SyncJack Schedule, right click on the desired schedule under ‘SyncJack Schedules’ and select ‘Delete Schedule’.

A Delete SyncJack Schedule pane appears

Select **OK**.

Step 24 To delete a PTP Clock Probe History Result, right click on the desired result under ‘History Estimations’ and select ‘Delete History Estimation’.

A confirmation screen appears

Select **OK**.

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Step 25 To delete a SyncJack PTP Clock Probe, right click on the desired probe and select ‘Delete PTP Clock Probe’.

A Delete Clock Probe pane appears

Select **OK**.

End of Procedure

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Clock Analysis - Telecom Slave Score

If a Telecom Slave is configured in the SP-100 under PTP, SyncJack can be used to test and score internal slave performance. Three scores are provided for frequency and time recovery:

- 5 - High Score - High Performance
- 4 - Medium Score - Marginal Performance
- 3 - Low Score - Low Performance

This scoring is used to estimate the frequency and phase accuracy of the internal SP-100 T-SC. Unlike Network Usability, this is the quality of the slave clock, not the network. The input is PTP packets, the output is a frequency accuracy and a phase accuracy score of 3, 4 or 5 for each as PM.

The Telecom Slave current configuration and statistics can be viewed by selecting the Telecom Slave (TS-1-1) under Clock Analysis. See Figure 236 on p. 370 for configuration view and Figure 237 on p. 371 for statistics summary view.

The T-SC target values for frequency and phase can be configured by right clicking on the Telecom Slave (TS-1-1) under Clock Analysis and selecting 'Edit Telecom Slave Analysis', then selecting the desired values for Frequency Recovery Target and Phase Recovery Target in the details pane and clicking on 'OK'. See Figure 238 on p. 371

To initialize the Telecom Slave PM registers, right click on the Telecom Slave (TS-1-1) under Clock Analysis and select 'Init Registers' and follow the procedure in "Initializing PM Registers" on p. 331

To edit the Telecom Slave PM Thresholds, right click on the Telecom Slave (TS-1-1) under Clock Analysis and select 'Edit Thresholds' and follow the procedure in "Editing PM Thresholds" on p. 332

Figure 236: Telecom Slave Configuration View

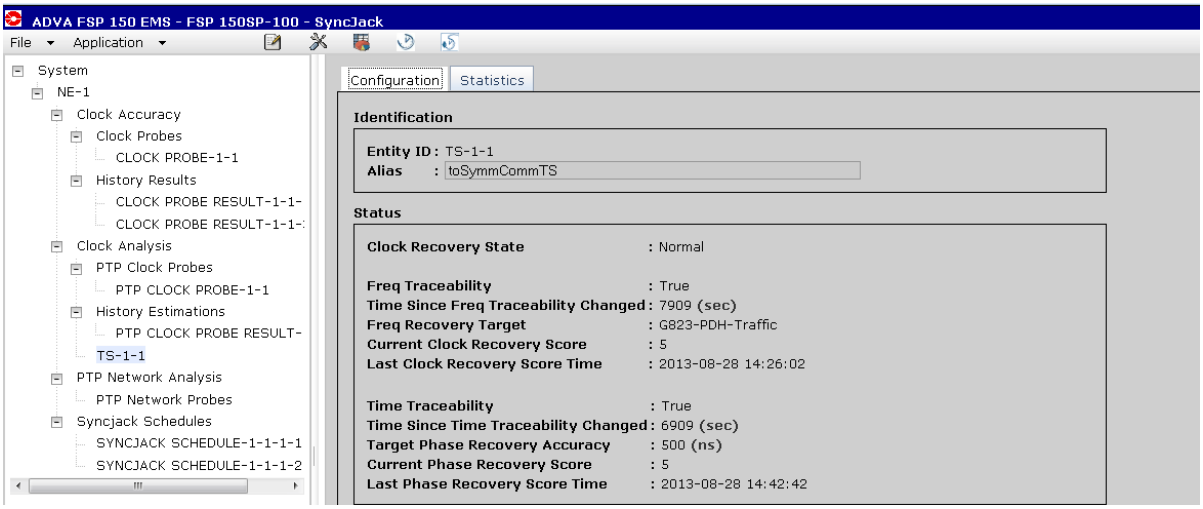

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Figure 237: Edit Telecom Slave Statistics Summary View

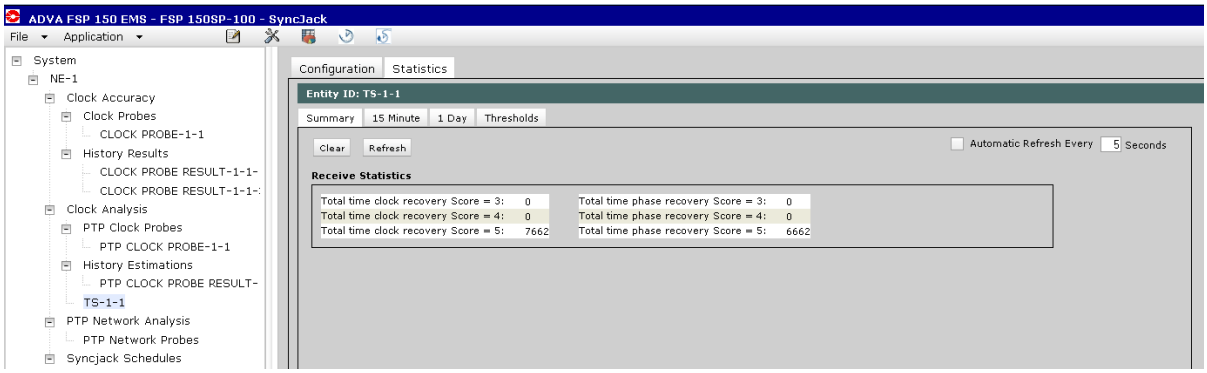
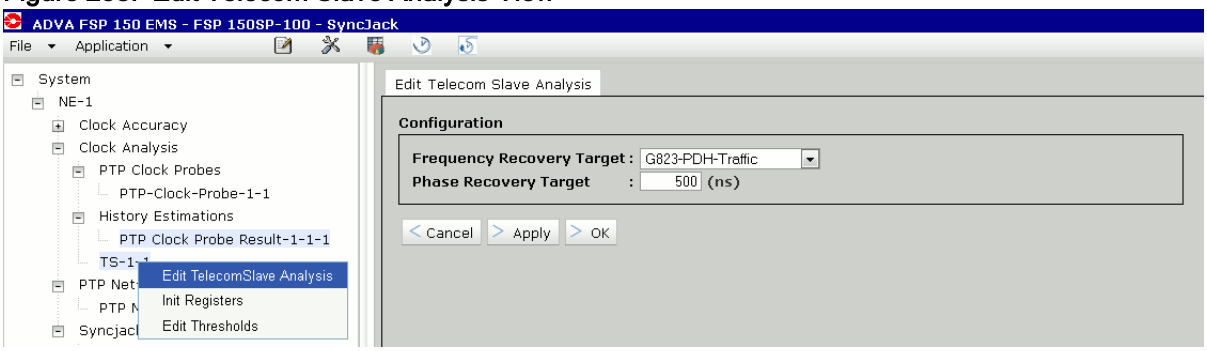


Figure 238: Edit Telecom Slave Analysis View



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Performing PTP Network Analysis

SyncJack PTP Network Analysis measures the level of network interference (PDV). The measurement is based on PDV either one-directional or two-directional. The input is reference clock used as reference to the Master Clock. The output is network statistics, path delay and network usability score.

The procedure for performing PTP Network Analysis assumes that SP-100 is properly connected to the clock inputs to be measured and the appropriate SP-100 interfaces have been configured. See “Provisioning the SP-100” on p. 153

Procedure

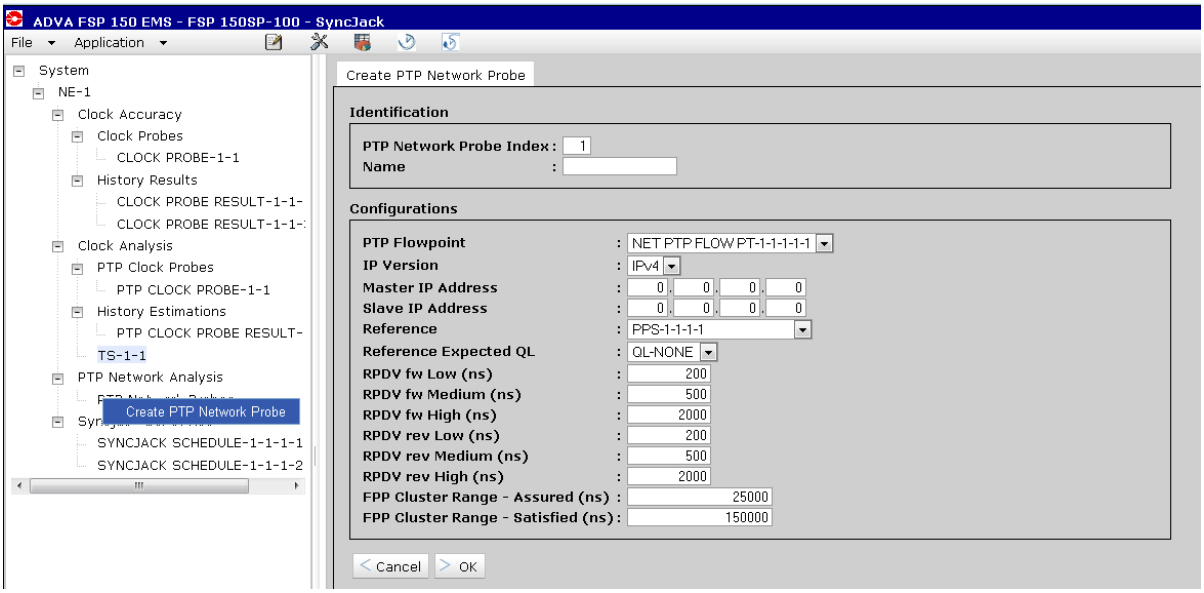
Step 1 Select the SyncJack icon or select **SyncJack** from the Applications menu, then expand the System selection tree.

Step 2 Expand the Network Element entity from the selection tree, then expand the PTP Network Analysis entity.

Step 3 Enter a right click on PTP Network Probes in the selection tree and select Create PTP Network Probe.

A Create PTP Network Probe pane appears

Figure 239: Create PTP Network Probe View



Step 4 Enter the following to configure the Clock Probe:

PTP Network Probe Index – EID for the probe. Enter a number from 1 to 9. (Create only)

Name – a text identifier (up to 15 characters, no spaces or special characters) for the probe. (Required entry.)

PTP Flowpoint - select the desired PTP Flowpoint from the drop-down list.

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IP Version - select the desired IP version from the drop-down list. (Only 'IPv4' is supported version for the current release.)

Master IP Address - enter the IP address of the master clock.(for parallel mode must be as configured for the PTP SOOC).

Slave IP Address - enter the IP address of the slave clock. (for parallel mode must be as configured for the PTP SOOC).

Reference – the signal reference for this Probe. The available references are populated in a drop-down list.

Reference Expected QL - clock quality level of the selected reference. The available QLs are provided in a drop-down list.

RPDV fw Low, ns - enter the desired Residual Path Delay Variation (RPDV) forward, low in nanoseconds

RPDV fw Medium, ns - enter the desired RPDV forward, medium in nanoseconds

RPDV fw High, ns - enter the desired RPDV forward, high in nanoseconds

RPDV rev Low, ns - enter the desired RPDV reverse, low in nanoseconds

RPDV rev Medium, ns - enter the desired RPDV reverse, medium in nanoseconds

RPDV rev High, ns - enter the desired RPDV reverse, high in nanoseconds

PDV Cluster Range - Assured, ns - enter the desired value in nanoseconds

PDV Cluster Range - Satisfied, ns - enter the desired value in nanoseconds

Select **OK**.

Step 5 Expand "PTP Network Probes" in the Selection Tree.

The newly created PTP Network Probe entity is present

Step 6 Select the newly created PTP Network Probe entity to verify entry.

Note

A PTP Network Probe can be edited after creation by right clicking on the entity name and selecting 'Edit Clock Probe'. All fields except the Clock Probe Index can be edited. When a probe is scheduled it cannot be modified or deleted.

Step 7 Enter a right click on SyncJack Schedules in the selection tree and select Create Schedule.

A Create Schedule pane appears

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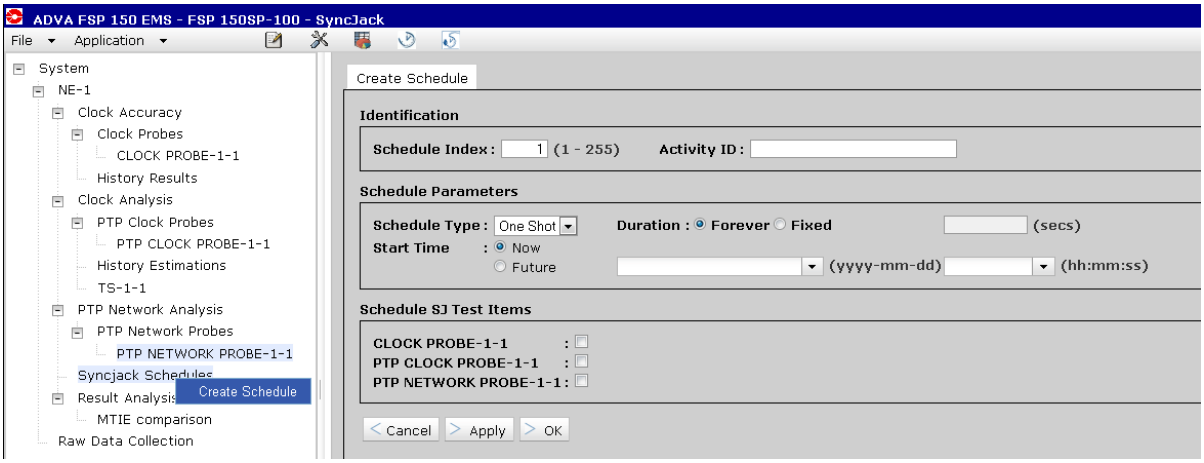
Figure 240: Create SyncJack Schedule



Step 8 Enter the following to configure the SyncJack Schedule:

Schedule Index – EID for the schedule. Enter a number from 1 to 255.

Activity ID – a text identifier (up to 15 characters, no spaces or special characters) for the probe.

Schedule Type – Select the desired type from the drop-down list. (Only 'One Shot' is currently supported)

Duration - Select either the 'Forever' or 'Fixed' radio button. If 'Fixed' is selected, enter the desired duration in seconds.

Start Time – select 'Now' or 'Future' radio button. If 'Future' is selected, enter the date and time for the test to start.

Schedule SJ Test Items - select the desired Probe(s) for this test from the list provided by clicking the related check box(es).

Select **OK**.

Step 9 Select the PTP Network Probe entity and Configuration tab to view the Syncjack Schedule State and test progress (State indicates whether the test is Failed, Waiting (Scheduled), Running or Completed).

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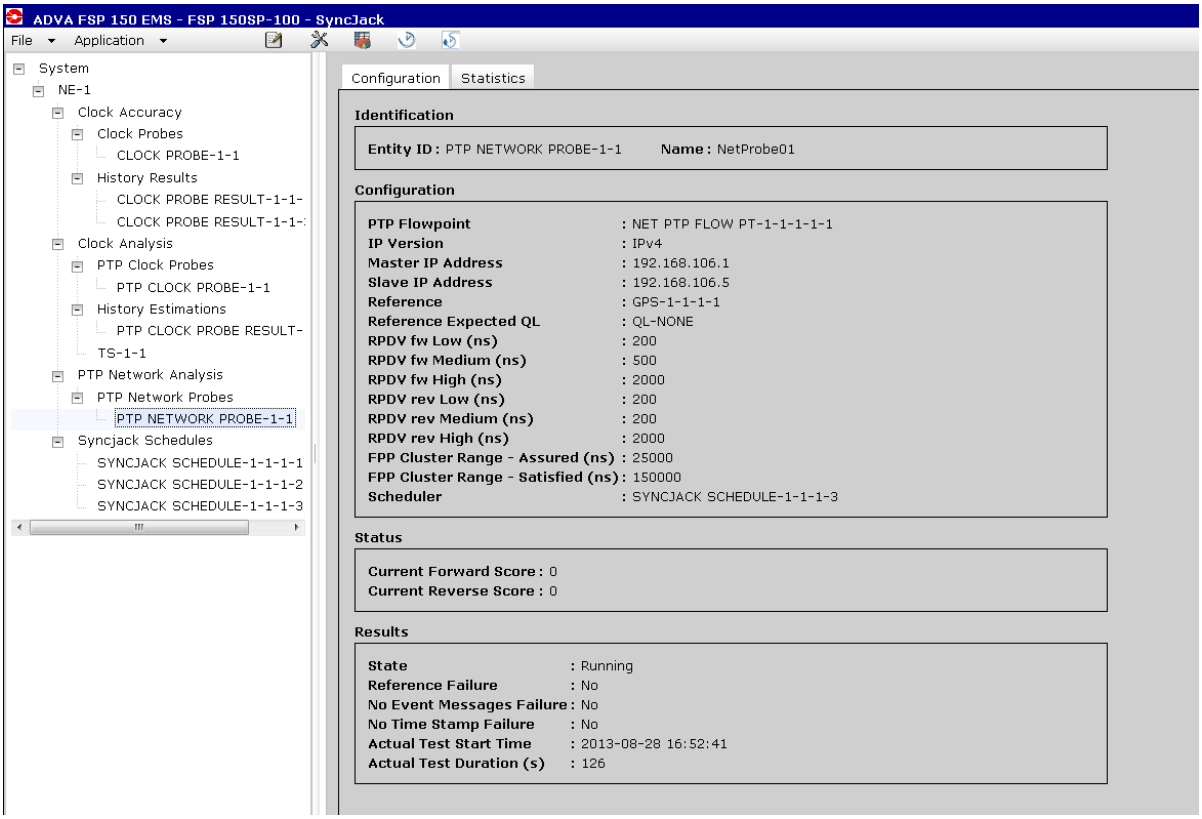
Figure 241: View SyncJack PTP Network Probe State - Running



Step 10 Click on the PTP Clock Probe entity again to observe when the test is completed.

Step 11 During or after the test is completed, the results are available by selecting the desired PTP Network Probe and selecting the Statistics tab.

A Summary pane appears

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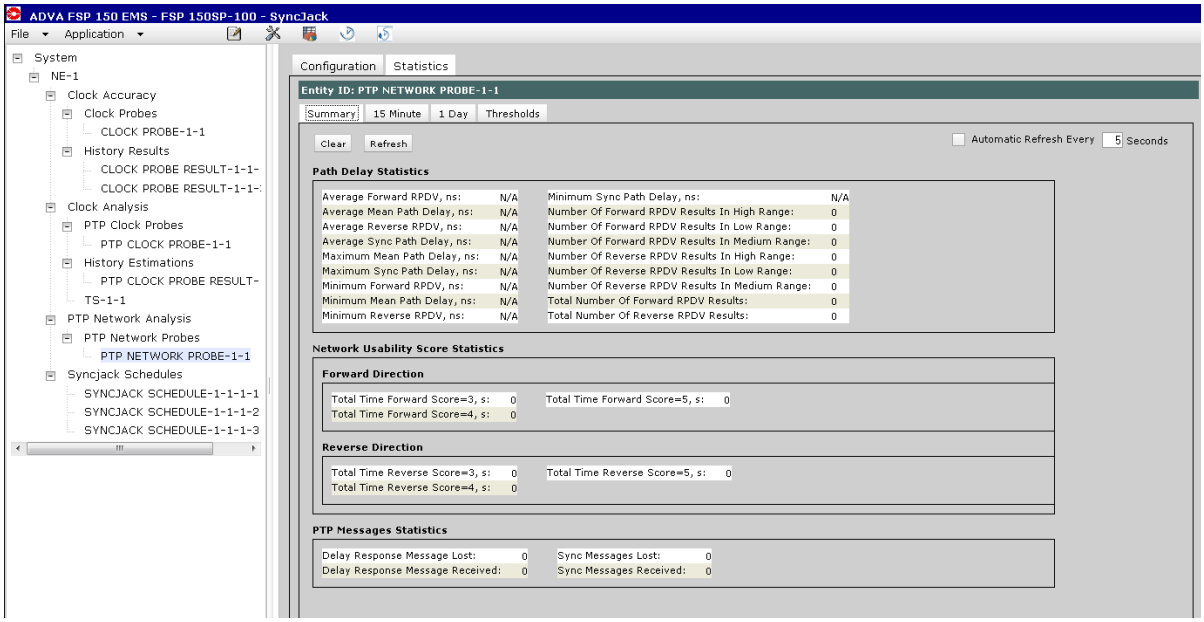
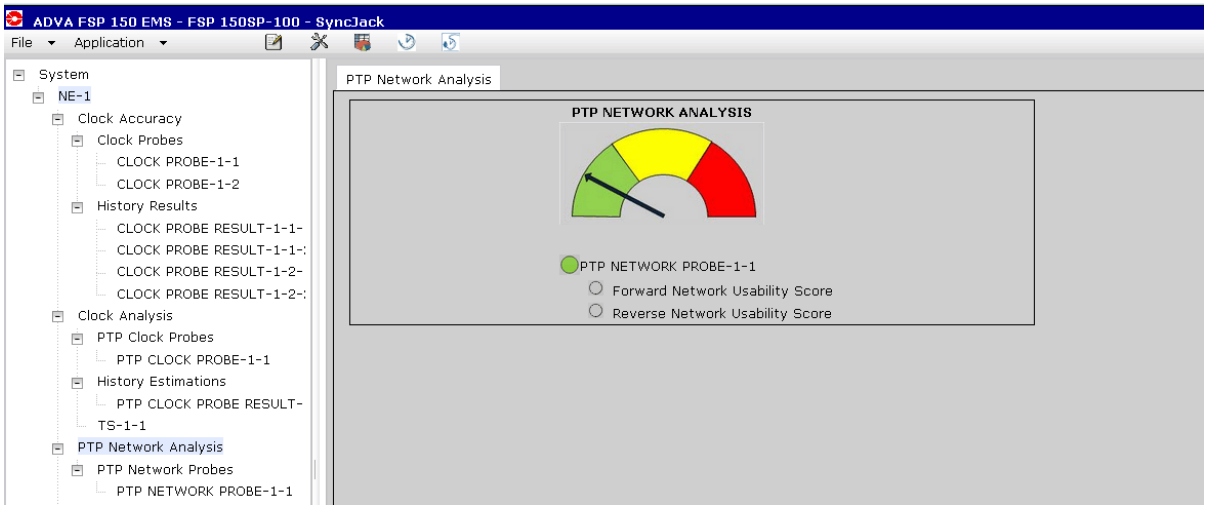
Figure 242: View SyncJack PTP Network Probe Statistics



Step 12 Select the PTP Network Analysis entity in the Selection Tree to view the PTP Network Analysis results via Dashboard meter (see Figure 243 on p. 376).

Figure 243: View PTP Network Analysis Result Meter



Step 13 Select the Network Element entity in the Selection Tree to view the PTP Network Analysis and Global results via Dashboard meter.

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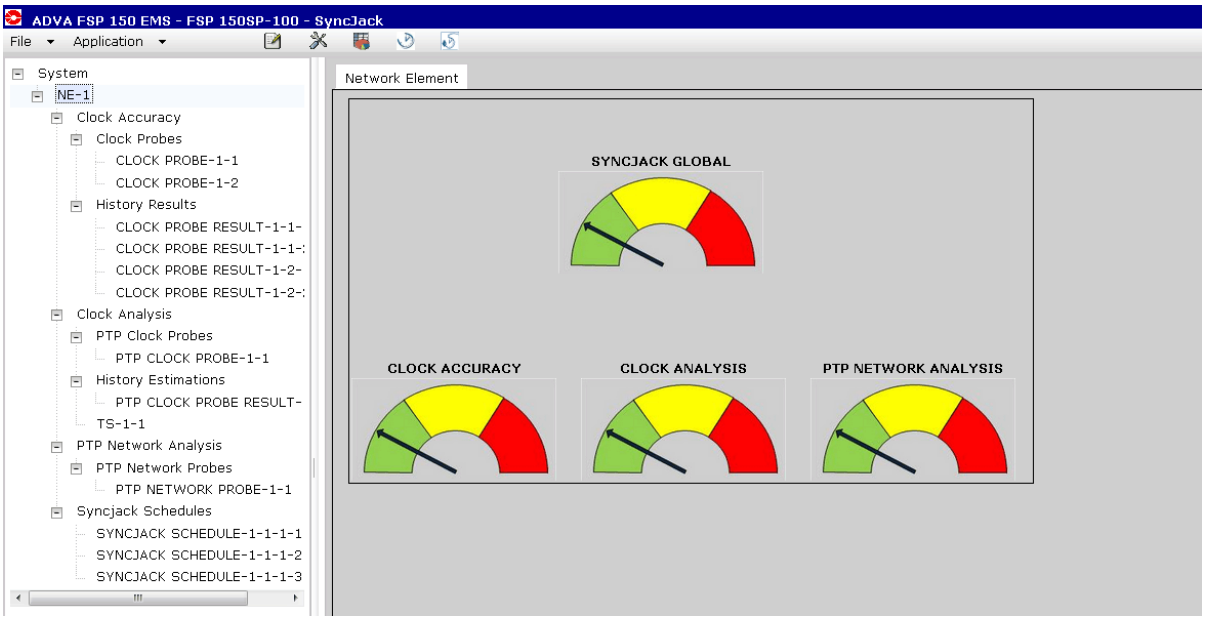
Note

The Clock Analysis meter will display test results only if the associated SyncJack schedule is present. Each result is associated with a color coded radio button according to its Probe/Score (green, yellow or red). If grey, this indicates the SyncJack schedule has been deleted or no score results are present.

Figure 244: View Global and PTP Network Analysis Dashboard



Step 14 To initialize the PM registers, right click on the PTP Network Probe and select ‘Init Registers’ and follow the procedure in “Initializing PM Registers” on p. 331

Step 15 To edit the PM Thresholds, right click on the PTP Network Probe and select ‘Edit Thresholds’ and follow the procedure in “Editing PM Thresholds” on p. 332

Step 16 To delete a SyncJack Schedule, right click on the desired schedule under ‘SyncJack Schedules’ and select ‘Delete Schedule’.

A Delete SyncJack Schedule pane appears

Select **OK**.

Step 17 To delete a SyncJack PTP Clock Probe, right click on the desired probe and select ‘Delete PTP Clock Probe’.

A Delete Clock Probe pane appears

Select **OK**.

End of Procedure

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Performing MTIE Result Comparison

SyncJack MTIE Result Comparison provides a comparison chart of up to 4 Results.

Procedure

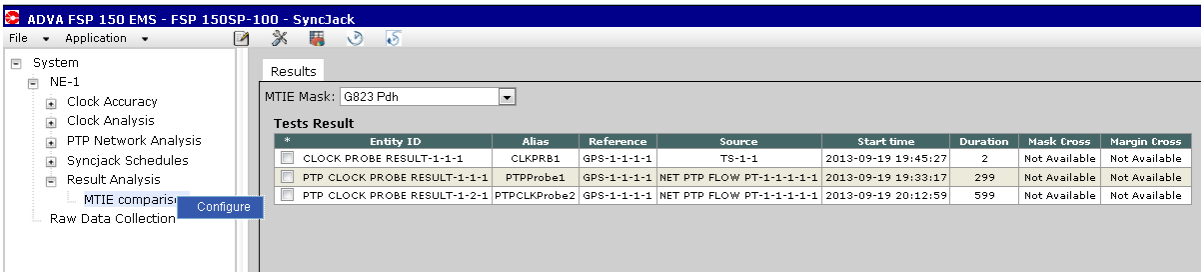
Step 1 Select the SyncJack icon or select **SyncJack** from the Applications menu, then expand the System selection tree.

Step 2 Expand the Network Element entity from the selection tree, then expand the Result Analysis entity.

Step 3 Enter a right click on MTIE Comparison in the selection tree and select **Configure**.

A Configure MTIE Comparison pane appears

Figure 245: Configure MTIE Comparison



Step 4 Enter the following to configure the MTIE Comparison:

a) Select the desired MTIE Mask.

b) Select the check box for each desired Probe Results (a maximum of four) to include in the comparison.

Step 5 Select the MTIE Comparison entity in the Selection Tree.

MTIE Comparison results are displayed

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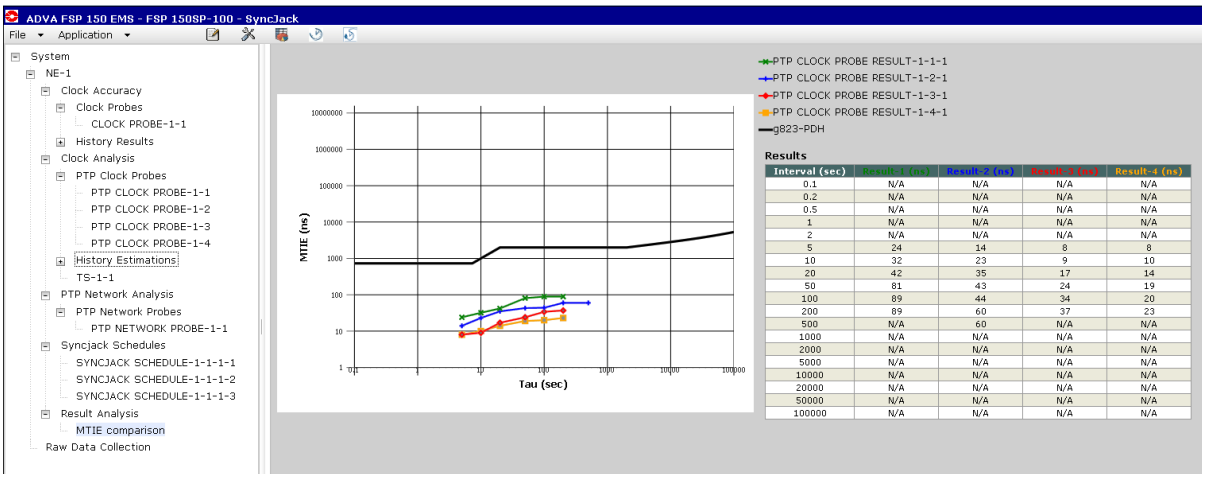
Figure 246: MTIE Comparison Results



End of Procedure

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Chapter 7

Alarms, Events and Probable Causes, Error Codes

Introduction

This chapter contains information supporting alarms and events generated by the system, their meaning and suggested trouble clearing methods. This chapter contains the following information:

- Recommended Steps for Trouble Clearing
- Obtaining Technical Assistance
- Alarm Attributes, Probable Cause and Trouble Clearing
- Alarm Masking

Recommended Steps for Trouble Clearing

In the event that alarms are raised after commissioning the SP-100, this procedure is provided to assist maintenance personnel in identifying the probable cause and clearing the alarm.

Procedure

Step 1 Ensure that an interface device, such as a craft interface, is connected to the network and is operating correctly before continuing.

Step 2 Establish a communication connection to the FSP 150SP and log on. See “Logging On and Off” on p. 130.

Step 3 Observe the Alarms Pane to view all current alarms, and record the alarm severity. See “Getting Familiar with eVision” on p. 133 for an overview of the eVision web browser management tool components and the location of the Alarm Window.

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Step 4 Determine which current alarm has the greatest service effect, and record the alarm. Service-affecting (SA) critical alarms should be cleared first, followed by Major SA alarms, and then Minor SA alarms. Then any remaining non-service-affecting (NSA) major alarms should be cleared, followed by any minor alarms.

Step 5 Locate the appropriate alarm indication description and suggested troubleshooting techniques for the specific problem.

Step 6 Refer to "Alarm Attributes, Probable Cause and Trouble Clearing" on p. 399 for identifying, interpreting, and troubleshooting alarms.

Step 7 Refer to "Connector and LED Descriptions" on p. 65 for descriptions of connectors and front-panel LED indications.

Step 8 After performing suggested trouble clearing actions, did the alarm or status condition clear?

a) If YES:

Record the time the alarm was cleared, and continue with the next step.

b) If NO:

Obtain ADVA Optical Networking technical assistance (see below).

Step 9 Repeat Step 5 and Step 6 for all alarms.

Step 10 Observe the Alarms Pane to view all current alarms. Have all alarm conditions been cleared?

a) If YES:

Go to the next step.

b) If NO:

Obtain ADVA Optical Networking technical assistance (see below).

Step 11 Log off all FSP 150SPs when finished.

End of Procedure

Obtaining Technical Assistance

Product Maintenance Agreements and other customer assistance agreements are available for ADVA Optical Networking products through your ADVA Optical Networking distribution channel. Technical support is available to warranty or maintenance contract customers who need technical assistance with an ADVA Optical Networking product that is under warranty or covered by a maintenance contract.

To display ADVA Optical Networking's Technical Support web site that includes all contact information, go to ADVA Optical Networking's home page at **`http://www.advaoptical.com`** and select the "`Support`" button.

ADVA Optical Networking's service options include:

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- 24 X 7 telephone support
- Web-based support tools
- On-site support
- Technical training, both on-site and at ADVA Optical Networking facilities in Germany and the USA
- Expedited repair service
- Extended hardware warranty service

customer Login

ADVA Optical Networking's customer login provides a suite of interactive, networking services that provide immediate access to ADVA Optical Networking information and resources at any time, from anywhere in the world. This highly integrated internet application is a powerful, easy-to-use tool for doing business with ADVA Optical Networking.

The customer login's broad range of features and services help customers to streamline business processes and improve productivity. Through your customer login, you will find information tailored especially for you, including networking solutions, services, and programs. In addition, you can resolve technical issues with online support services, download and test software packages, and order ADVA Optical Networking training materials.

Access your customer login via the ADVA Optical Networking home page at **`http://www.advaoptical.com`**.

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Error Codes and System Responses

This table lists the error codes and the associated definitions or responses. The _why_ attribute is a response string that is defined by the system software. All possible _why_ responses are listed under the "**Where Why is:**" when an error code can have multiple responses. Before the response is sent to the user the error codes are mapped based on the message type. Each group of error codes is sorted by a system condition or type.

Table 26: Error Codes and Definitions

Error Code	Response
GENERAL SYSTEM CONDITIONS	
0	Operation completed successfully.
1	Unknown error.
2	Mei application shutdown failed.
3	File _filename_ does not exist
4	No Response _from_
5	User _username_ is locked out.
6	User _username_ is not logged in.
7	User _username_ locked out - _loginnum_ unsuccessful login attempts.
8	User _username_ locked out.
9	Remote User Login failed: _why_ **Where Why is:** Athentication failed Radius setup failed Invalid password

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Error Code	Response
ENTITY CONDITIONS	
256	Entity does not exist.
257	Entity already exists.
258	Next child entity does not exist.
259	Set operation is not supported.
260	Create operation is not supported.
261	Delete operation is not supported.
262	_actiontype_ operation is not supported.
263	Get variable objects operation is not supported.
264	Maximum (_maxnum_) number of _entityname_ entities has been reached.
265	Total _rsrc_ resource amount of _totalval_ exceeds max limit of _maxval_
266	Allocating_val_#_unit_of_rsrc_resource from _container_failed - total amount of _totalval_#_unit1_ exceeds max limit of _maxval_#_unit2_
267	IP address _ipaddr_/_mask_ of interface _if_ overlaps with address of interface _overlapif_
268	Operation denied: _why_ Create denied: _why_ Delete denied: _why_ Edit denied: _why_ Retrieve denied: _why_ Action denied: _why_ **Where Why is:** System in Db Maintenance Mode
269	Operation denied: _why_ Create denied: _why_ Delete denied: _why_ Edit denied: _why_ Retrieve denied: _why_ Action denied: _why_ **Where Why is:** Object is transient

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Error Code	Response
271 - 275	Operation denied: _why_ Create denied: _why_ Delete denied: _why_ Edit denied: _why_ Retrieve denied: _why_ Action denied: _why_ **Where Why is:** (EID) MD name causes MA ID length to exceed limit (xxx MIN... yyy MAX) (EID) Probe's Source MEP(eid2) is in [xxx] state (xxx) not supported on CP unit return (xxx) is used by IPV4 PROXY ARP ENTRY (xxx) is used by IPV4 STATIC ARP ENTRY (xxx) is used by IPV4 STATIC ROUTE (xxx) state is not support on CP Unit A2N Policer not specified for CTAG's Priority (xxx) A member in the VID list (xxx) matches the primary vid of vlan entry [eid] A MEP exists with associated component ID Address cannot be broadcast, mutlicast or all 0's Admin State is (xxx) Admin State is not in (xxx) state AIS client MD level (xxx) must be greater than MEP MD level of (yyy) AIS generation cannot be enabled at MD level (xxx) AIS Trigger has duplicate values An Ethernet port with speed configured as (xxx) cannot be added to the reference selector list Associated MA COMP entity does not exist At least 1 (xxx) must exist on a Flow At least 1 Policer must exist on a Flow At least 1 Shaper must exist on a Flow At least 1 VLAN Member must exist Authentication Protocol cannot be (xxx) Because there is a Y1731 probe (xxx) Both Primary and Backup server have zero IP addresses Build Shadow Tree failed Cannot delete a scheduled probe Cannot delete an active reflector Cannot edit Network port 2 Cannot edit Protecting Port attributes Cannot have both Primary and Backup server's IP addresses set to zero Cannot not suspend an active reflector Cannot resume a schedule that is not suspended Cannot start non-suspended schedule Cannot stop non-active schedule Cannot suspend non-active schedule Can't reopen System Default Db Card (xxx) found in slot Chosen DMM Packet Interval consumes (xxx) CIR and EIR cannot both be 0 Clear not supported on CP unit Community (xxx) used by Target Address (yyy) Community (xxx) used by Target Parameter (yyy)

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Error Code	Response
271 - 275 (Continued)	**Where Why is:** Config file is busy Config operation failed Configfile is not in progress Create or Open configfile failed Db State is not ok DHCP is enabled Diagnostics are active on Port Diagnostics not supported on network port Data TLV exceed the allowed maximum of (xxx MAX) Disable SFTP first, to disable the SSH Duplicate MA Name - conflicts with (xxx) Duplicate MD name - conflicts with (eid) Duplicate MD name (same MD level) - conflicts with (eid) Duplicate MEP ID list Duplicate VID list - duplicate entry (xxx) found in (eid) ECPA test is active on Port Ecpa test not active enable SSH first, to enable SFTP Enter a hex number following the MAC address ESA Probe belongs to an active schedule (xxx) Existing MEP ID (xxx) cannot be removed from the MEP List Flow is (xxx) For primary VID type, range should be (xxx MIN... yyy MAX) Incompatible (xxx) card for (yyy) slot Internal error - unable to allocate resource Internal error - unable to allocate VLAN entry resources Internal error - unable to release resource Internal error - unable to release VLAN entry resources Invalid hex number Invalid MAC address Invalid MAC-INTEGER format Invalid name format: (xxx) Invalid primary vid Invalid primary vid - must be 0, component primary vid or must be from the vlan table LLF Trigger has duplicate values LLF triggers are not supported on service based down MEP Loopback already exists Loopback is active on Port MA COMP's (eid) Primary VID (xxx) cannot be in VID list MA name causes MA ID length to exceed limit (xxx MIN... yyy MAX) MA Name format cannot be set to (xxx) when MD Name format is set to (yyy) MA name is too long MA NET Name should be set when changing the MA NET format MA primary VID cannot be a VID member in VLAN table Management Tunnel Buffer Size must be at least (xxx KB) Management Tunnel CIR must be at least (xxx) bps MANET Name cannot be empty Manual Etherjack Diagnostics currently in progress

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Error Code	Response
271 - 275 (Continued)	**Where Why is:** Max MEP count exceeded for the primary VID or Max MEP count exceeded for the port Max MEP count exceeded Maximum MA name length supported in (xxx) is (yyy) Maximum management bandwidth (xxx bps) exceeded (yyy bps remaining) MD Name cannot be empty MD Name cannot be greater than (xxx MAX) MD Name cannot be set when MD name format is NONE MD Name format cannot be set to (xxx) when (eid) Name format is set to ICC format MD Name is not set MD Name should be set when changing the MD format MEP at level (xxx MAX) cannot generate AIS MEP at this MD level already exists for the primary VID MEP ID (xxx) is not in the MEP list of MA Network MEP ID (xxx) not found in the list N2A Rate Limiting is disabled. NE already accepted Network clock type may be set onlty via Sync No VID based MEP can be created on network port 2 NTP client is enabled OAM is disabled on port Only down MEP is allowed on network ports Only COPPER port available Only init/suspended/completed schedule can be deleted Only one MA COMP can be created under an MA Network Only one MEP allowed under this MA Network Only one port based down MEP can be created on a port Out of range. Enter a 2 byte integer Port based Up MEP is not allowed on access ports Port does not exist for (xxx) Port is a FROM PORT of Network Element (xxx) Port OAM is enabled Port QL Mode is enabled Port Rx Pause is enabled Primary vid [xxx] found in the VID list of [eid] Primary VID cannot be in the VID list Primary VID MA NET name (xxx) is not same as MA COMP primary VID Primary VID MA NET name is not same as MA COMP primary VID (xxx) Protecting port is in Sync Reference list Protection Group does not exist for port Protection Switching is not supported in (xxx) mode Regeneration currently in progress Security level of the user (xxx) is (yyy) SFTP can not be set to enabled, when trying to disable SSH Shaper is used by Policer (xxx) Shaped speed greater than Configured speed Shaped speed cannot be 0

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Error Code	Response
271 - 275 (Continued)	**Where Why is:** SSH can not be set to disabled, when trying to enable SFTP Switch Action is not supported in (xxx) mode System in Db Maintenance Mode System Defaults Database is busy System Defaults Value File is busy Test not active Test stream not active The File description is invalid, length of string is 0-127 and can't contains double quotation marks, semicolon(;) and pound(#) The file name must be 1-32 characters long, must have only a-z, A-Z, 0-9, (.), - and _, but can not be (.) or (..) There are MA COMP entries for this MA There are MA Network entries for this MD There are MEP entries for this MA There is a Y1731 probe (xxx) This entity has an active ESA Probe (xxx) This object cannot be deleted This will cause MIPs limit to exceed Tunnel IP address is being used as system source IP address Tunnel IP address is being used by SNMP v1 trap PDU Two vlan entries cannot have the same VID list for the same port Valid Until date is in the past Valid Until date is out of range allowed Value DEFER is not allowed for MD MHF Creation Control VID list cannot be empty VID list contains duplicate entries VID list size exceeds the maximum of [MaxVlanMbrs] including the Primary VID VID member (xxx) VLAN member (xxx) already exists at position (xxx) VLAN member (xxx) does not exist VPN OUI out of range (0 .. 0xFFFFFF)
276	Attribute values are inconsistent
277	_entityname_ does not exist
278	Invalid Admin State: _why_ **Where Why is:** (xxx) not valid for entity. (xxx) state is not supported A port in the reference selector list cannot be unassigned Admin State is in (xxx) state Admin State is not in (xxx) state Cannot enable QL mode if AdminState is set to unassigned Entity (xxx) is in (xxx) state Parent state (xxx) higher than (yyy) Port must (xxx) to change service type Port state (xxx) higher than (yyy)

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Error Code	Response
279	Invalid Loopback configuration: _why_ **Where Why is:** (xxx) is currently active on this port (xxx) Loopback cannot have Vlans enabled (xxx) must have at least one Vlan enabled Loopback config not supported for OAM passive mode. OAM mode is (xxx) Swap SA-DA must be (xxx) for EFM OAM Loopbacks
280	
281	Data not available for _entityeid_: _why_ **Where Why is:** Admin State is UNASSIGNED PM Thresholds not supported PM not monitored on CP Flow
282	Port _entityeid_ is not eligible to be put in selector reference list: _why_ **Where Why is:** A port can only be added to the reference selector list if it is assigned An Ethernet port with speed configured as (xxx) cannot be added to the reference selector list An Ethernet port with SyncE mode disabled cannot be added to the reference selector list It is already present in the list

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Error Code	Response
ATTRIBUTE SPECIFIC	
512	Invalid value: _why_ **Where Why is:** (xxx) already used by user (yyy) (xxx) ARP route can be created (xxx) can be set only for protocol belonging to protocol group (xxx) cannot be set (xxx) C-Tag Control option is not applicable when service type is (yyy) (xxx) flow need to be MultiCOS enabled (xxx) flow with UNTAGGED support need to have different COS level support (xxx) has more than 1 Remote MEP (xxx) has no Remote MEPs (xxx) has non-zero EIR (xxx) is already scheduled in (yyy) (xxx) is currently active on this port (xxx) is different than USM user (yyy) (xxx) is not valid value (xxx) is the last Superuser (xxx) not available (xxx) not available for (yyy) speed (xxx) not supported by (yyy) (xxx) not supported for Service Mode (yyy) (IPort Mode) (xxx) not supported for UNTAGGED frames (xxx) not supported on CP unit (xxx) Out Of Range (xxx MIN...yyy MAX) (xxx) requires valid address/mask (xxx) speed not supported on (yyy) (xxx) state is not supported A port in the reference selector list cannot be unassigned A Reference entity must Access, Network or BitsIn port Address cannot be broadcast, multicast, or begin with 0. Address cannot be (xxx) Address cannot be broadcast Address cannot be broadcast, mutlicast or all 0's. Address cannot be experimental address Address cannot be Loopback Address cannot be loopback, broadcast, multicast, or begin with 0 Address cannot be multicast Address cannot begin with 0 An Ethernet port in the reference selector list cannot be configured as (xxx) Attribute missing - authentication key Attribute missing - authentication protocol Because Service type is in (xxx) mode Bin index = (xxx) not in range Cannot be empty Cannot configure (xxx) loopback type Cannot create (xxx) flow Cannot create (xxx) flow with VLAN members

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Error Code	Response
512 (continued)	**Where Why is:** Cannot enable QL Mode because the port configuration does not support SSM Cannot enable QL Mode unless SyncE Mode is also enabled Cannot enable SVlan on (xxx) Cannot enable SyncE on a port with speed of 10Mbps Cannot set Administrative State to Maintenance/Disabled Cannot set name to empty string Community (xxx) used by Target Parameter (yyy) Component does not exist for (xxx) Component ID - must be access port or network port Current Network Clock Type does not support this QL value Data TLV exceeds the allowed maximum of (xxx MIN... yyy MAX) Delay must be (xxx MIN... yyy MAX) DHCP client is enabled on (xxx) DHCP server already enabled on other interface Disposition cannot be set to (xxx) Distrubution History Bin index = (xxx) not in range Duplicate VLAN member (xxx) at positions (yyy) and (zzz) Dying Gasp is already enabled for IP (xxx) on Target Address (yyy) Empty string Ether type can only be (0X88a8) or (0X8100) Filename is empty Filename must begin with digit or alphabet letter Flows with UNTAGGED support need to be MultiCOS enabled For TOS should not be higher than (xxx MAX) Given IP address is not valid Given IP mask is not valid History Bin index = (xxx) not in valid range ID (xxx) already used by (yyy) ID must be 1 Illegal network mask (xxx) In DHCP Server mode mask cannot be 255.255.255.254 and 255.255.255.255 Ingress PUSH PVID change disallowed Inner VLAN Tag enabled without Outer VLAN Tag enabled Interface must be eth0 or management tunnel interface Invalid character Invalid first character Invalid character (xxx) at position (yyy) Invalid engine ID - contains non-hex characters Invalid engine ID - must be 12 octets long (first bit is 0) Invalid engine ID - must be 5 to 32 octets long (first bit is 1) Invalid engine ID - must be even number of octets Invalid IP Address Invalid port Invalid Port Number Invalid shelf state - state not supported IP Addr Overlaps with other interface IP is 0.0.0.0 for nexthop route ipaddr: port format required Key invalid or not strong enough

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Error Code	Response
512 (continued)	**Where Why is:** Length exceeds limit - must be 1 to (xxx) LTM Egress ID must be in hexadecimal format LTM Egress ID must contain 8 octets Max value cannot be less than min value Message processing model (xxx) Metric must be (0… xxx MAX) Min value exceeds max value Mixed DOS and UNIX path More than 1 enabled server has priority Multi COS is disabled Multi-COS flow must have N2A Rate Limiting enabled Must be disabled for given Line Type Must have only a-z, A-Z, 0-9, (.), - and _. Name must be 1- (xxx) characters long and contain only alphanumeric characters Name must be unique Negative number Network Port disposition is set to (xxx) No upper case characters No lowercase characters Not a valid IP address Not a valid IP mask NTP is disabled Only (xxx) can be created Only (xxx) IP route can be created Only 1 (xxx) Flow may exist on Port Only 1 is allowed as MA COMP index Only InService and Management states are valid Out of Range (0...7) Out of Range (1...100) Out of Range (xxx MAX) Out of Range (xxx MIN... yyy MAX) Password cannot be “password” or “passw0rd” Password contains character sequence Password same as username Password too long Password too short Pathname is empty Periodic schedule cannot have forever duration Port belongs to different unit. Port disposition is set to (xxx) or (yyy) Port does not exist for (xxx) Port must be Network Port 1 Port service type is (xxx) Port shaping is disabled Port speed of 10 Mbps requires SyncE to be disabled Priority Out Of Range (xxx MIN… yyy MAX) Probe's Source MEP Protocol cannot be none

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Error Code	Response
512 (continued)	**Where Why is:** QL Mode is enabled; disable QL Mode first ROLLOVER Route to subnet/host (xxx) already exists Sample time cannot be more than (xxx) Duration time Sample time cannot be more than Duration time Schedule list contains entity that is not a probe Schedule list is empty Schedule type conflicts with other attribute Security Level of user (xxx) is (yyy) Selected MEP destination type does not allow to specify ID Selected MEP destination type does not allow to specify MAC address Should be between (xxx MIN) and (yyy MAX) (inclusive) Should be between (xxx MIN) and (yyy MAX) bytes (inclusive) Should not be higher than (xxx MAX) Source IP already in use by a Reflector Source IP already used by a Probe Source MEP does not exist Source MEP should be an Up MEP Specified IP address is already used by a Probe Specified IP address is already used by another Reflector Specified MAC address is invalid Specified name is already in use (xxx) and (yyy) Specified Source MEP is already used by (xxx) Specified tag is invalid Start Time in the past is not allowed SyncE Mode cannot be disabled because this port is used in the reference selector list SysLog is disabled Target Parameter (xxx) used by Target Address (yyy) Too few digits To few special characters Too many consecutively repeated chars Total provisioned CIR (xxx) bps exceeds port speed (yyy) bps Total provisioned EIR (xxx) bps exceeds (yyy) bps Traffic Management cannot be disabled Tunnel already exists on (xxx) Tunnel index must be from 1 to 255 Unknown interval Unknown MEP destination type Unknown Network Clock Type Unknown priority map mode (xxx) Unknown protocol type Unknown/unsupported Unsupported for given Line Type Untagged support with (xxx) Untagged support with (xxx) is disallowed Username too long Username too short USM Security Name (xxx) used by Target Parameter (xxx)

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Error Code	Response
512 (continued)	**Where Why is:** Value (xxx) out of range Value (xxx) out of range (xxx MIN… yyy MAX) Value must be NONE or PUSH Value not supported for (xxx) VLAN member cannot be specified as *-* Vlan members are not supported for Service Mode (xxx) VLAN member range must be of the form m:n-*, where (xxx) VLAN members must have a single wild card value (xxx) VLAN Tag is off but tag is specified Vlan Tags not unique
513	Mandatory attribute missing.
514	Attribute cannot be set.
515	Attribute not supported
516	Attribute value (xxx) not supported
517	Invalid MAC address.
518	Invalid VLAN tag.
519	Invalid password: _why_ **Where Why is:** Key invalid or not strong enough Password is same as username
520	Invalid IP Address.
521	Invalid Network Mask.
522	Outer VLAN Tag Control must be enabled to enable Inner VLAN Tag Control.
523	_entityname_ does not exist.
524	Attribute not applicable _why_ **Where Why is:** Management Traffic Bridging is enabled Network mask is not applicable for PPP DHCP is not applicable for PPP RIPv2 is not applicable for PPP

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Error Code	Response
SPECIAL CONDITIONS	
768	Card _cardeid_ not present.
773	Invalid Loopback Configuration Type.
775	Resource in Use by Loopback.
780	Timed loopback with Vlan tag enabled.
781	Non-Vlan loopback with Vlan tag enabled.
784	Loopback is not active.
785	Loopback already exists.
794	Invalid test config.
795	Port Not in Auto Negotiation.
796	Linktrace is currently active
797	Loopback is currently active
798	Maximum active linktrace sessions reached
799	Maximum active loopback sessions reached
800	Port media is invalid.
801	Operation is not supported.
802	No Linktrace Reply found.
803	Interface not configured.
804	Route to Host/Subnetwork already exists.
805	Invalid Gateway IP Address.
806	Invalid Route Type.
807	Invalid SWDL message
808	Backup file is locked
809	Invalid backup type
810	Database has not been backed up
811	Backup directory is empty
812	Failed to archive files
813	Failed to unarchive files
814	Failed to read directory
815	Transfer in progress
816	Transfer not in progress
817	File Transfer Server Type not supported
818	User id not set
819	Remote host not set
820	Remote file not set
821	Local file not set
822	File Name not set
823	Protocol not set
824	Unsupported protocol
825	Transfer protocol has been disabled
826	Invalid url
827	Transfer canceled
828	Unable to access local file

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Error Code	Response
829	Transfer execute failed
830	Error string returned
831	Bad archive file
832	Error syncing with scu
833	Error processing topology change event
834	SCU push failed
835	Flash erase failed
836	Flash partition sync failed
837	Install Failed
838	Activate Failed
839	Cancel Activate Failed
840	Validate Failed
841	Revert Failed
842	Operation not allowed in current state
843	Invalid Validation Time
844	Invalid Reboot Time
845	Operation not allowed: Database upload in progress
846	Operation not allowed: Database download in progress
847	Operation not allowed: Database backup in progress
848	Operation not allowed: Database restore in progress
849	Operation not allowed: Software download in progress
850	Operation not allowed: Software install in progress
851	Operation not allowed: Software upgrade in progress
852	Operation not allowed: Software validate in progress
853	Operation not allowed: Software cancel-upgrade in progress
854	Operation not allowed: Software revert in progress
855	Operation not allowed: System rebooting
856	Operation not allowed: System software being upgraded
857	Software is incompatible for Network Element
858	Sysdefdb directory is empty
RESOURCE ERRORS	
1024	Exhausted Total Number of Policers.
1025	Exhausted Total Number of Queues.
1026	Exhausted Total Number of Memory Segments.
1027	Exhausted Total Number of VLAN Lookups.
1028	Exhausted Total Number of EVC Lookups.
1029	Insufficient bandwidth for CIR/EIR settings.
1280	Rules check failed.
1281	Rules check failed: (_errstr_).
SOFTWARE RELATED	
4096	Invalid message qualifier.
4097	Resource is busy.

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Error Code	Response
4098	Database operation failed: _why_ **Where Why is:** Db State is not ok Can't reopen System Default Db Build Shadow Tree failed
4099	Loading data from database failed.
4100	User transaction does not exist.
4101	User transaction has not been validated.
4102	Request has been timed out.
4103	Transaction id is 0.
4104	Cannot get global system data.
4105	Invalid application event.
4106	No FROM port found for NE.
4107	Configfile operation failed.
4108	Loading data from configfile failed: _why_ **Where Why is:** Can't open configfile _configFileName_failed_command Init load failed Login failed
8000	MEIATTR_TIMING_SOURCE
8001	MEIATTR_MAX_SLAVE_SUPPORTED
8002	MEIATTR_MAX_STATIC_SLAVE_SUPPORTED
8003	MEIATTR_SLAVE_ANNOUNCE_MSG_RATE
8004	MEIATTR_SLAVE_SYNC_MSG_RATE
8005	MEIATTR_SLAVE_DELAY_RESP_MSG_RATE
8006	MEIATTR_ALIAS_ERROR
8007	MEIATTR_TIME_CLOCK_EID
8008	MEIATTR_TIMEREF
8009	MEIATTR_SYNC_OPER_TYPE
8010	MEIATTR_SYNC_REF_REQ
8011	MEIATTR_SYNC_DOMAIN
8012	MEIATTR_SELECTION_MODE
8192	Invalid message received
8193	Invalid user
8194	Unable to update profile
8195	Internal error
8196	Internal error
8197	Internal error - IPC
8198	Internal error
8199	Internal error - EP
8200	Invalid user name received
8201	insufficient privilege level
SNMP SPECIFIC	
20480	Attribute is deprecated

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Error Code	Response
20481	VLAN ID is not specified
20482	Invalid Data for Cable Length Benchmark, Required format xx.yy

Alarm Attributes, Probable Cause and Trouble Clearing

All problems causing an alarm event are soaked for 2.5 seconds before the alarm indication is raised. The problem causing the alarm event must clear for 10 seconds before the alarm indication is cleared. All FSP 150SP System alarms and default notification codes are shown in Table 28 on p. 401. For all FSP 150SP Access and Network alarms, see Table 31 on p. 417. For Maintenance End Point (MEP) alarms, see Table 5-21. Each of the following tables contain a description of the alarm condition, probable cause and suggested trouble clearing procedure. To clear alarm conditions, it is suggested that you start by using the trouble clearing procedure in “Recommended Steps for Trouble Clearing” on p. 381.

Alarm Profile Notification Codes

The user has the ability to retrieve and edit alarm profile Notification Codes. To modify alarm Notification Codes for a given alarm condition type using eVision, select Maintenance view, right click on the desired entity in the Selection Tree and select **Edit Alarm Attributes**. The options available for notification codes are: Critical, Major, Minor, Not Alarmed or Not Reported. For LED locations associated with an alarm condition, refer to “Connector and LED Descriptions” on p. 65. Valid Notification Codes are provided in the following table.

Table 27: Alarm Profile Notification Codes

Notification Code	Description
CR	Critical - A severe, service-affecting condition has occurred and that immediate corrective action is imperative.
MJ	Major - A serious disruption of service or a malfunction or failure of an important system function.
MN	Minor - Trouble that does not have a serious effect on service to customers or for trouble in functions that are not essential to the NE operation.
NA	Not Alarmed - A condition that is reported only as an event and can be retrieved from the system.
NR	Not Reported - A condition that is not reported but can be retrieved from the system.
CR	Clear - This value can not be used in an alarm profile. Used with event reporting only.

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Alarms and Events

Refer to the following table for system alarm conditions and their associated probable cause, default Notification Code and suggested trouble clearing procedure. System components include the following subsystems:

- System
- NTESP100 Card
- NTESP100 Shelf
- Synchronization
- Precision Time Protocol (PTP) Alarms
- Network Port and Access Port Alarms
- Alarm Masking

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Table 28: System Alarms and Events

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
System					
Primary NTP Server Failed	Attempt to connect to the Primary NTP Server failed.[1]	1) Verify that the IP address can be reached (respond to pings) by performing both a ping and a trace route from the management tunnel's IP address. 2) Verify management communication configuration.	Minor	N/A	N/A
	a) Target IP address connectivity or routing problem.	**a)** Repair IP address connectivity or routing problem.			
	b) No NTP server / NTP server down.	**b)** Switch to Backup NTP Server. Repair NTP server.			
Backup NTP Server Failed	Attempt to connect to the Backup NTP Server failed.[1]	1) Verify that the IP address can be reached (respond to pings) by performing both a ping and a trace route from the management tunnel's IP address. 2) Verify management communication configuration.	Minor	N/A	N/A
	a) Target IP address connectivity or routing problem.	**a)** Repair IP address connectivity or routing problem.			
	b) No NTP server / NTP server down.	**b)** Switch to Primary NTP Server. Repair NTP server.			
IP Address Conflict	IP Address Conflict (declared when a DHCP assigned address overlaps with an existing subnet)	Verify management communication configuration.	N/A	CR	N/A
Data Base - File Transfer In Progress	Database file transfer is in progress.	No action required.	Not Reported	N/A	N/A
SWDL - File Transfer In Progress	Software Download file transfer is in progress.	No action required.	Not Reported	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
SWDL - Installation In Progress	Software Download installation is in progress.	No action required.	Not Reported	N/A	N/A
SWDL - Activation In Progress	Software Download activation is in progress.	No action required.	Not Alarmed	N/A	N/A
SWDL - Validation In Progress	Software Download validation is in progress.	No action required.	Not Alarmed	N/A	N/A
SNMP Dying Gasp - Host Unreachable	Database or Network issue.	Check database settings for SNMP Dying Gasp. If correct, test network access - Ping the Host address.	Minor	N/A	N/A
SNMP Dying Gasp - Resource Busy	SNMP Dying Gasp is enabled on multiple trap hosts and there is reachability to these trap hosts via the same interface. On a 1+1 Network Interface, there can only be a single SNMP trap host with SNMP Dying Gasp Enabled. Enabling a second trap host for SNMP dying gasp raises the alarm. or There are multiple management tunnels active (Network side is unprotected with tunnel, Access side also has tunnel). 2 SNMP trap hosts that resolve to 2 different interfaces are supported. Enabling SNMP Dying Gasp on a third trap host raises the alarm.	Check database settings for SNMP Dying Gasp. Delete extra port assignments.	Minor	N/A	N/A

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Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
DB Downgrade	Database Downgrade - implementation of a database file below the current release level.	No Action Required	Not Reported	N/A	N/A
File Transfer In Progress	File transfer is in progress.	No action required.	Not Reported	N/A	N/A
Operation In Progress	Operation is in progress.	No action required.	Not Reported	N/A	N/A
Network Element					
3G USB Modem					
Link Down	Link Down is generated when a physical connection is lost on the port.	Perform an Etherjack Diagnostic test. Repair the port using test results.	Not Alarmed	N/A	N/A
No SIM Card	No SIM card is detected.	Unplug the 3G modem, insert the SIM card into the modem, and re-insert the 3G modem into the USB port.	Not Alarmed	N/A	N/A
Modem is not qualified	The modem is not qualified by ADVA Optical Networking.	Install an ADVA Optical Networking qualified 3G modem.	Not Alarmed	N/A	N/A
Modem Removed	3G modem is removed from the USB port.	Re-insert ADVA Optical Networking qualified 3G modem.	Not Alarmed	N/A	N/A
DCN Port					
Link Down	Cable disconnected, cable fault, improper configuration.	Check physical cabling, MDIX is not supported on DCN port. Check settings on system to match DCN network requirements.	Not Alarmed	Not Alarmed	N/A
NTESP100 Card					
Communication Failure	Communication Failure	Equipment is malfunctioning. Repair or replace unit.	Minor	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Equipment Fault	Equipment fault found.	Equipment is malfunctioning. Repair or replace unit.	N/A	Critical	Status Red
Equipment Does Not Match Provisioning	Equipment does not match the provisioning.	Verify the provisioning against the equipment. Re-provision as necessary.	N/A	Critical	Status Blinking Red
Equipment Provisioned But Removed	Equipment is provisioned but equipment is removed.	Replace equipment or place out of service.	N/A	Critical	N/A
Test Alarm	A test alarm is generated to check alarm propagation.	Ensure alarm propagates properly.	Major	N/A	N/A
NTESP100 Shelf					
Over Temperature	Equipment has exceeded the temperature limit (>= 90 C).	Check ambient temperature and adjust. Verify that airflow requirements are met.	Minor	N/A	Status Red
Under Temperature	System temperature has dropped below the minimum temperature threshold (<= -50 C).	Check ambient temperature and adjust.	Minor	N/A	Status Red
Synchronization					
10MHz (CLK) Port					
Sync Reference Failed	Sync Reference Failed. This alarm reported when the CLK port is used as system Synchronization input. The port must be assigned and the port must be a member of the system clock selector list for this condition to exist.	Ensure that the CLK cable is connected.	Not Alarmed	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Frequency Offset	Frequency Offset. The synchronization circuit detected a frequency offset problem with the port's recovered clock. The port must be assigned and the port must be a member of the system clock selector list for this condition to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
Output Squelch	The port is squelched due to the port's output signal QL being lower than the port's configured Squelch attribute. The port's QL Mode attribute must be configured as enabled and the Squelch QL attribute must be configured as anything besides None for this condition to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
Sync Reference Locked Out	A Sync Reference has been locked out. Usually due to failure, configuration changes planned or maintenance operations.	Test the Locked Out Sync Reference and remove lock out when reference is fully functional again.	Minor	N/A	N/A
Sync Reference Forced Switch	A forced switch operation has been performed on a Sync Reference.	Evaluate reason for forced switch operation and when appropriate, remove the forced switch.	Minor	N/A	N/A
Sync Reference Manual Switch	A manual switch operation has been performed on a Sync Reference.	Evaluate reason for the manual switch operation.	Minor	N/A	N/A
Sync Reference Wait To Restore	A Sync Reference has been restored and is in WTR timing.	No Action Required.	Minor	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
BITS In Port					
Alarm Indication Signal	BITS Alarm Indication Signal.	Verify and troubleshoot clock reference. Verify and troubleshoot possible signal mismatch. In order for proper BITS-IN and BITS-OUT inter-operate with source equipment/test sets, the user must manually match the FSP 150SP's Network Clock Type with the BITS line type. If a T1 is the desired BITS Line Type, then Network Clock Type should be set to "Option 2". If a 2048kHz or E1 is the desired BITS Line Type, then Network Clock Type should be set to "Option 1".	Not Reported	N/A	N/A
Frequency Offset	Frequency Offset. The synchronization circuit detected a frequency offset problem with the BITS-IN port's recovered clock. The BITS-IN port must be assigned and the BITS-IN port must be a member of the system clock selector list for this condition to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Loss of Frame	BITS Loss of Frame	Verify and troubleshoot clock reference. Verify and troubleshoot possible signal mismatch. In order for proper BITS-IN and BITS-OUT inter-operate with source equipment/ test sets, the user must manually match the FSP 150SP's Network Clock Type with the BITS line type. If a T1 is the desired BITS Line Type, then Network Clock Type should be set to "Option 2". If a 2048kHz or E1 is the desired BITS Line Type, then Network Clock Type should be set to "Option 1".	Minor	N/A	N/A
Loss of Signal	BITS Loss of Signal. BITs signal is lost.	Verify and troubleshoot clock reference connection.	Minor	N/A	N/A
Sync QL Invalid	Synchronization Quality Level Invalid.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
Sync QL Mismatch	Synchronization Quality Level Mismatch. The BITS-IN port receives SSM messages whose specified Quality Level is lower than the Expected QL. The BITS-IN port's QL Mode attribute must be configured as enabled and the Expected QL attribute must be configured as anything besides None for this condition to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Sync Reference Failed	Synchronization Referencing Failed. The BITS-IN port has failed in such a way that its clock cannot be recovered, thus preventing it from being used as a synchronization reference (e.g., LOS). The BITS-IN port must be assigned for this condition primitive to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
Sync Reference Wait To Restore	A Sync Reference has been restored and is in WTR timing.	No Action Required.	Minor	N/A	N/A
Sync Reference Locked Out	A Sync Reference has been locked out. Usually due to failure, configuration changes planned or maintenance operations.	Test the Locked Out Sync Reference and remove lock out when reference is fully functional again.	Minor	N/A	N/A
Sync Reference Forced Switch	A forced switch operation has been performed on a Sync Reference.	Evaluate reason for forced switch operation and when appropriate, remove the forced switch.	Minor	N/A	N/A
Sync Reference Manual Switch	A manual switch operation has been performed on a Sync Reference.	Evaluate reason for the manual switch operation.	Minor	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
BITS Out Port					
Output Squelch	Quality Level Squelch. The BITS-OUT port is squelched due to the system's QL being lower than the BITS-OUT port's configured Squelch QL attribute. The BITS-OUT port's QL Mode attribute must be configured as enabled and the Squelch QL attribute must be configured as anything besides None for this condition to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
GPS Port					
GPS Antenna Fail	GPS Antenna Fail. This condition may be reported during normal GPS Receiver operation when active antenna draws less current, in such cases like connection with splitter or long antenna cable.	Ignore if Operational state is Normal. If operational state is not Normal: • Check number of tracked Satellites. If 0: check antenna cable is securely connected to the antenna input. • Ensure the antenna required power is compatible with the SP-100 supplied power (3.3V). • Ensure sufficient sky view is available above the antenna. • Replace antenna.	Minor	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
PPS Port					
Output Squelch	Output of the PPS port has been squelched due to change of state of the entity serving as the port's source.	Verify and troubleshoot PPS port source.	Minor	N/A	N/A
SYNC-1-1-1					
All Input Sync Referenced Failed	All synchronization references in the system clock selector list have failed. The system clock selector list must have at least one member in order for this condition primitive to exist.	Verify and troubleshoot clock reference.	Major	N/A	N/A
Sys Clock Mode - Fast Acquisition	System Clock Mode - Fast Acquisition Synchronization. This indicates the clock selector is acquiring the phase of the selected reference.	No action necessary.	Not Reported	N/A	N/A
Sys Clock Mode - Freerunning	System Clock Mode - Free Running Synchronization. This indicates the internal oscillator is the source of the system clock.	Verify synchronization provisioning to ensure option is set correctly. Otherwise, no action is necessary.	Not Reported	N/A	N/A
Sys Clock Mode - Holdover	System Clock Mode - Holdover Synchronization. This indicates the selected reference is invalid and no other valid input reference is available and the system clock has previously locked to the now invalid reference.	Verify and troubleshoot clock reference.	Not Reported	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Sys Clock Mode - Loss of Lock	System Clock Mode - Loss of Lock. This indicates the selected reference had locked and is not invalid and the lock has been lost. While in this state, the clock selector will be attempting to acquire the phase of the selected reference.	Verify and troubleshoot clock reference.	Not Reported	N/A	N/A
Average Holdover Frequency Not Ready	Clock was not synced long enough to enter holdover and is now freerunning.	No action necessary.	Not Reported	N/A	N/A
Time Reference Locked Out	Sync-1-1-1 provisioned as Time Reference of Time Clock and has been Locked out.	Test the Locked Out Time Reference and remove lock out when reference is fully functional again.	Minor	N/A	N/A
Time Reference Forced Switch	Sync-1-1-1 provisioned as Time Reference of Time Clock and Force Switch has been applied.	Evaluate reason for forced switch operation and when appropriate, remove the forced switch.	Minor	N/A	N/A
Time Reference Unavailable	Sync-1-1-1 provisioned as Time Reference of Time Clock and Unavailable to serve as valid reference.	Check Sync-1-1-1 Sync References, ensure that Sync-1-1-1 Operational state is "Normal" and Clock Mode is "Locked".	Minor	N/A	N/A
Time Reference Degraded	Sync-1-1-1 provisioned as Time Reference of Time Clock and can't provide valid TOD. This condition is persistently reported.	N/A	Minor	N/A	N/A
Time Reference Unavailable WTR	Sync-1-1-1 provisioned as Time Reference of Time Clock and is recovery process from Unavailable condition.	N/A	Minor	N/A	N/A

Table 28: System Alarms and Events (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Time Reference Degraded WTR	Sync-1-1-1 provisioned as Time Reference of Time Clock and in the recovery process from Degraded condition. Note: this condition is never reported for Sync-1-1-1.	N/A	Minor	N/A	N/A
Time Clock					
Time Clock Not Locked	Time Reference Locked Out.	N/A	Minor	N/A	N/A
Time Frequency Lock	Time Clock Time Traceability status is Time Freq Lock.	N/A	Minor	N/A	N/A
Time Frequency Not Traceable	Time Clock Frequency Trace-ability status is Not Traceable.	N/A	Minor	N/A	N/A
Time Holdover	Time Clock Time Traceability status is Holdover.	N/A	Minor	N/A	N/A
Time Not Traceable	Time Clock Time Traceability status is Not Traceable.	N/A	Minor	N/A	N/A
Time Of Day (TOD) Port					
Output Squelch	Output of the TOD port has been squelched due to change of state of the entity serving as the port's source.	Verify and troubleshoot TOD port source.	Minor	N/A	N/A

1. When using Ethernet encapsulated management tunnels, the source IP address of the ping used to validate reachability of the trap host is the IP address assigned to the management tunnel, and not the system IP address.

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Precision Time Protocol (PTP) Alarms

This section describes Precision Time Protocol (PTP) alarm conditions.

SOOC Alarms

Refer to the following table for PTP Slave-Only Ordinary Clocks (SOOC) alarm conditions and their associated probable cause, default notification code and suggested trouble clearing procedure.

Table 29: SOOC Alarms

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
PTSF - Loss Sync	Packet Timing Signal Fail - Loss of Synchronization. A Sync/Followup is not received before syncReceiptTimeout or Delay Response is not received before delRespReceiptTimeout. A loopback on the port on which the PTP Flowpoint of the SOOC exists will result in a PTSF - Loss of Sync.	a) Verify and troubleshoot clock reference. b) Release loopback.	Minor	N/A	N/A
PTSF - Loss Announce	Packet Timing Signal Fail - Loss Announce. Announce is not received before announceReceiptTimeout. A loopback on the port on which the PTP Flowpoint of the SOOC exists will result in a PTSF - Loss Announce.	a) Verify and troubleshoot clock reference. b) Release loopback.	Minor	N/A	N/A
PTSF - Unusable	Packet Timing Signal Fail - Unusable. The PTP packet stream is not usable for clock recovery. For example, unable to recover clock due to unacceptable PTP packet PDV.	Verify and troubleshoot clock reference.	Minor	N/A	N/A

Telecom Slave Alarms

Refer to the following table for PTP Telecom Slave alarm conditions and their associated probable cause, default notification code and suggested trouble clearing procedure.

Table 30: Telecom Slave Alarms

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Sync Reference Failed	Synchronization Referencing Failed. The TS has failed in such a way that its clock cannot be recovered, thus preventing it from being used as a synchronization reference. The TS must be assigned for this condition primitive to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
Sync QL Mismatch	Synchronization Quality Level Mismatch. The TS receives SSM messages whose specified Quality Level is lower than the Expected QL. The TS's QL Mode attribute must be configured as enabled and the Expected QL attribute must be configured as anything besides None for this condition to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
Frequency Offset	Frequency Offset. The synchronization circuit detected a frequency offset problem with the TS's recovered clock. The TS must be assigned and the TS must be a member of the system clock selector list for this condition to exist.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
Sync QL Invalid	Synchronization Quality Level Invalid.	Verify and troubleshoot clock reference.	Minor	N/A	N/A
Sync Reference Locked Out	A Sync Reference has been locked out. Usually due to failure, configuration changes planned or maintenance operations.	Test the Locked Out Sync Reference and remove lock out when reference is fully functional again.	Minor	N/A	N/A

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Table 30: Telecom Slave Alarms (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Sync Reference Forced Switch	A forced switch operation has been performed on a Sync Reference.	Evaluate reason for forced switch operation and when appropriate, remove the forced switch.	Minor	N/A	N/A
Sync Reference Manual Switch	A manual switch operation has been performed on a Sync Reference.	Evaluate reason for the manual switch operation.	Minor	N/A	N/A
Sync Reference Wait To Restore	A Sync Reference has been restored and is in WTR timing.	No Action Required.	Minor	N/A	N/A
All SOOCs Failed	All Slave-Only Ordinary Clocks (SOOC) failed. The OC-S Virtual Port in a Faulty state or a PTSF Alarm exists on the SOOC.	Verify and troubleshoot clock reference.	N/A	Critical	N/A
Telecom Slave in Freerun	Telecom Slave in Freerun. The recovered clock is the same as the internal oscillator and the Telecom Slave is in freerun.	Verify and troubleshoot clock reference and provisioning.	NR	N/A	N/A
Telecom Slave in Holdover	Telecom Slave in Holdover. The recovered clock is in holdover as there is no valid SOOC to support clock recovery.	Verify and troubleshoot clock reference and provisioning.	NR	N/A	N/A
SJ No Time Lock	SyncJack is not locked to a reference time source.	Verify and troubleshoot clock reference and provisioning.	N/A	Major	N/A
SJ No Frequency Lock	SyncJack is not locked to a reference frequency source.	Verify and troubleshoot clock reference and provisioning.	N/A	Major	N/A
Time Reference Locked Out	Telecom Slave provisioned as Time Reference for the Time Clock and has been locked out.	N/A	Minor	N/A	N/A
Time Reference Forced Switch	Telecom Slave provisioned as Time Reference for the Time Clock and has been Forced.	N/A	Minor	N/A	N/A

Table 30: Telecom Slave Alarms (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Time Reference Unavailable	Telecom Slave provisioned as Time Reference for the Time Clock and Unavailable.	Check the Telecom Slave Frequency traceability status (Syncjack clock analysis is required). If Syncjack is not available, check the Telecom Slave Frequency Recovery state.	Minor	N/A	N/A
Time Reference Degraded	Telecom Slave provisioned as Time Reference for the Time Clock and can't provide valid TOD.	Check the Telecom Slave Time traceability status (Syncjack clock analysis is required). If Syncjack is not available, check the Telecom Slave Phase Recovery state.	Minor	N/A	N/A
Telecom Slave in Time Freerun	Telecom Slave is not locked to TOD.	N/A	Minor	N/A	N/A
Telecom Slave in Time Holdover	Telecom slave time recovery is in Holdover.	N/A	NR	N/A	N/A
Time Reference Unavailable WTR	Telecom Slave provisioned as Time Reference for the Time Clock and is in recovery process from Unavailable condition.	N/A	Minor	N/A	N/A
Time Reference Degraded WTR	Telecom Slave provisioned as Time Reference for the Time Clock and is in recovery process from Degraded condition.	N/A	Minor	N/A	N/A

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Network Port and Access Port Alarms

Refer to the following table for Network Port and Access Port (including Line Card Access Port) alarm conditions and their associated probable cause, default notification code and suggested trouble clearing procedure.

Table 31: Network Port and Access Port Alarms

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Duplex Mode of Far End Device Unknown	Duplex mode of the connected equipment is unknown. The unit determined it cannot conclude negotiation with remote end on the Ethernet port. Although auto negotiation failure is a minor alarm, it is usually followed by a critical alarm due to link down.	Determine the expected port speed setting and ensure that both ends are configured to reflect that setting.	Minor	Major	Facility Yellow
Link Down - Cause Not Determined	Link Down is generated when a physical connection is lost on a good link on the Ethernet interface port (Access or Network). Upon the loss of connection on a given port, this is the first notification being sent, before any specific cause is determined (such as cable fault or cable removed).	Wait a few moments for the system to isolate the trouble and observe another Link Down condition on this interface. Troubleshoot according to the new condition.	Minor	Critical	Facility Red Link/Rate Off
Link Down - Cable Fault	Link Down is generated when a physical connection is lost on a good link on the Ethernet interface port (Access or Network). A Cable Fault notification is sent when it is determined that the link is down due to a cable fault on a copper (RJ-45) port.	Perform an Etherjack Diagnostic test. Repair the cable using test results.	Minor	Critical	Facility Red Link/Rate Off

Table 31: Network Port and Access Port Alarms (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Link Down - Cable Removed	Link Down is generated when a physical connection is lost on a good link on the Ethernet interface port (Access or Network). A Cable Removed notification is sent when it is determined that the link is down due to a cable being locally removed from its RJ-45 port connection.	Insert or repair cable.	Minor	Critical	Facility Red Link/Rate Off
Link Down - Auto-Negotiation Failed	Link Down is generated when a physical connection is lost on a good link on the Ethernet interface port (Access or Network). Auto negotiation fault indicates the Far End is not advertising its auto negotiation rate.	Test and repair far end equipment.	Minor	Critical	Facility Red Link/Rate Off
Link Down	Link Down is generated when a physical connection is lost on a good link on the Ethernet interface port (Access or Network).	Perform an Etherjack Diagnostic test. Repair the port using test results.	Minor	Critical	Facility Red Link/Rate Off
Link Down - Master Slave Config	Link Down Master Slave Configuration.	Verify Master Slave configuration.	Minor	Critical	Facility Red Link/Rate Off
Receiving Jabber	The total number of packets received were longer than the MTU size, and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error), or a bad FCS with a non-integral number of octets (Alignment Error).	Verify the signal leaving the far end NID, through any inter-mediate equipment, and at the near end. Probable Cause: Network problem, or possibly a bad cable. Repair faulty equipment or cable.	Minor	Major	Facility Red

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Table 31: Network Port and Access Port Alarms (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
SFP is not qualified (Fiber only)	SFP is not qualified, but inventory information indicates that it may still work.	Remove SFP module and replace with an ADVA Optical Networking-approved module for that interface type.	Minor	N/A	N/A
SFP - Provisioning Mismatch (Fiber only)	Small Form-factor Plug-able (SFP) optics module mismatch. The installed SFP module does not match the provisioned module type for the interface. The system expects the SFP to conform to the MSA specification for inventory contents and and alarm will be raised if the SFP's inventory data does not reflect that the device supports the configured speed.	Remove SFP module and replace with an ADVA Optical Networking-approved module for that interface type.	Minor	Critical	Facility Red Link/Rate Off
SFP - Removed (Fiber only)	Small Form-factor Plug-able optics module is removed.	Install SFP module.	Minor	Critical	Facility Red Link/Rate Off
SFP - Transmit Fault (Fiber only)	Small Form-factor Plug-able optics module failure.	Replace SFP module.	Minor	Critical	Facility Red
Sync Reference Failed	Synchronization Referencing Failed. The Network Port or Access Port has failed in such a way that its clock cannot be recovered, thus preventing it from being used as a synchronization reference (e.g., LOS). The port must be assigned for this condition to exist.	Verify synchronization network and provisioning.	Minor	N/A	N/A
Loss of ESMC	Loss of Ethernet Synchronization Messaging Channel (ESMC).	Verify synchronization network and provisioning.	Minor	N/A	N/A

Table 31: Network Port and Access Port Alarms (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Sync QL Mismatch	Synchronization Quality Level Mismatch. The Network Port or Access Port receives SSM messages whose specified Quality Level is lower than the Expected QL. The port's QL Mode attribute must be configured as enabled and the Expected QL attribute must be configured as anything besides None for this condition to exist.	Verify synchronization network and provisioning.	Minor	N/A	N/A
Frequency Offset	Synchronization Frequency Offset. The synchronization circuit detected a frequency offset problem with the Network Port or Access Port's recovered clock. The port must be assigned and the port must be a member of the system clock selector list for this condition to exist.	Verify synchronization network and provisioning.	Minor	N/A	N/A
Sync QL Invalid	Synchronization Quality Level Invalid. The Ethernet port receives Synchronization Status Messaging (SSM) slow protocol messages whose specified Quality Level is invalid. The Ethernet port's QL Mode attribute must be configured as enabled for this condition primitive to exist.	Verify synchronization network and provisioning.	Minor	N/A	N/A
Bandwidth Exceeds Negotiated Speed (Access Port only)	Bandwidth Exceeds Negotiated Speed.	Verify provisioning and adjust accordingly.	Minor	Major	Facility Red
Sync Reference Wait To Restore	A Sync Reference has been restored and is in WTR timing.	No Action Required.	Minor	N/A	N/A

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Table 31: Network Port and Access Port Alarms (Continued)

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
Sync Reference Locked Out	A Sync Reference has been locked out. Usually due to failure, configuration changes planned or maintenance operations.	Test the Locked Out Sync Reference and remove lock out when reference is fully functional again.	Minor	N/A	N/A
Sync Reference Forced Switch	A forced switch operation has been performed on a Sync Reference.	Evaluate reason for forced switch operation and when appropriate, remove the forced switch.	Minor	N/A	N/A
Sync Reference Manual Switch	A manual switch operation has been performed on a Sync Reference.	Evaluate reason for the manual switch operation.	Minor	N/A	N/A

Syncjack Alarms

This section describes Syncjack alarm conditions.

Clock Probe Alarms

Refer to the following table for Clock Probe alarm conditions and their associated probable cause, default notification code and suggested trouble clearing procedure.

Table 32: Clock Probe Alarms

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
SJTEST Reference Fail	Probe Reference signal failed. May be caused by signal loss or signal accuracy degradation detected.	For case of external signal check cable connection.	Minor	N/A	N/A
SJTEST Source Fail	Probe source signal failed. May be caused by signal loss or signal accuracy degradation detected.	For case of external signal check cable connection.	Minor	N/A	N/A

PTP Clock Probe Alarms

Refer to the following table for PTP Clock Probe alarm conditions and their associated probable cause, default notification code and suggested trouble clearing procedure.

Table 33: PTP Clock Probe Alarms

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
SJTEST Reference Fail	Probe Reference signal failed. May be caused by signal loss or signal accuracy degradation detected.	For case of external signal check cable connection.	Minor	N/A	N/A
SJTEST No Timestamp	PTP Clock probe does not receive valid timestamps in the PTP event messages.	Make sure PTP Clock under test event messages comprise valid timestamps.	Minor	N/A	N/A
SJTEST No Messages	PTP Clock probe does not receive PTP event messages from the Clock under test.	Validate PTP Clock Probe configuration, check connectivity to the Clock under test.	Minor	N/A	N/A

PTP Network Probe Alarms

Refer to the following table for PTP Network Probe alarm conditions and their associated probable cause, default notification code and suggested trouble clearing procedure.

Table 34: PTP Network Probe Alarms

Condition Type	Description / Probable Cause	Trouble Clearing Procedure	NSA Default Notification	SA Default Notification	LED Indication
SJTEST Reference Fail	Probe Reference signal failed. May be caused by signal loss or signal accuracy degradation detected.	For case of external signal check cable connection.	Minor	N/A	N/A
SJTEST No Messages	PTP Clock probe does not receive PTP event messages from the Clock under test.	Validate PTP Clock Probe configuration, check connectivity to the Clock under test.	Minor	N/A	N/A

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Alarm Masking

Refer to the following tables for alarm masking, where certain alarms or conditions may mask the raising of an underlying condition, and until the “masking” alarms are cleared, the underlying alarms may not be seen.

Table 35: Alarm Masking Rules

Condition Type		Alarm Rule
SNMP Alarm Name	**eVision GUI Alarm Name**	
NTESP100 Card		
ctneqpt	Communication Failure	ctneqpt **and not** eqptremoved **or** mismatch
eqptflt	Equipment Fault	eqptflt **and not** eqptremoved **or** mismatch
mismatch	Equipment Does Not Match Provisioning	mismatch **and not** eqptremoved
eqptremoved	Equipment Provisioned But Removed	eqptremoved (no masking)
NTESP100 Shelf		
overtemp	Over Temperature	overtemp **and not** eqptremoved **or** mismatch
overvoltage	Over Voltage	overvoltage **and not** eqptremoved **or** mismatch
undertemp	Under Temperature	undertemp **and not** eqptremoved **or** mismatch
undervoltage	Under Voltage	undervoltage **and not** eqptremoved **or** mismatch
Synchronization		
allsyncref	All Input Sync Referenced Failed	allsyncref (no masking)
fstsync	Sys Clock Mode - Fast Acquisition	fstsync (no masking)
frngsync	Sys Clock Mode - Freerunning	frngsync (no masking)
hldovrsync	Sys Clock Mode - Holdover	hldovrsync (no masking)
losloc	Sys Clock Mode - Loss of Lock	losloc (no masking)
wtr	Sys Clock Mode - Wait To Restore	wtr (no masking)

Table 35: Alarm Masking Rules (Continued)

Condition Type		Alarm Rule
SNMP Alarm Name	eVision GUI Alarm Name	
BITS In		
ais	Alarm Indication Signal	ais **and not** los
freqoff	Frequency Offset	freqoff (no masking)
lof	Loss of Frame	lof **and not** los **or** ais
los	Loss of Signal	los (no masking)
qlinvalid	Sync QL Invalid	qlinvalid (no masking)
qlmismatch	Sync QL Mismatch	qlmismatch **and not** qlinvalid
syncref	Sync Reference Failed	syncref (no masking)
BITS Out		
qlsqlch	QL Squelch	qlsqlch (no masking)
Ethernet Port		
bwexceedednegspeed	Bandwidth Exceeds Negotiated Speed	bwexceedednegspeed (no masking)
freqoff	Frequency Offset	freqoff (no masking)
lnkdeactivated	Link Down - De-activated	lnkdeactivated **and not** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp
autonegunknown	Duplex Mode of Farend Device Unknown	autonegunknown **and not** lnkdownunisolated **or** lnkdownlpbkfault **or** lnkdowncableremoved **or** lnkdowncablefault **or** lnkdownautonegfailed **or** lnkdeactivated **or** rxjabber **or** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdownmasterslavecfg
lnkdownautonegfailed	Link Down - Auto-Negotiation Failed	lnkdownautonegfailed **and not** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdeactivated **or** lnkdownmasterslavecfg
lnkdowncablefault	Link Down - Cable Fault	lnkdowncablefault **and not** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdeactivated **or** lnkdownmasterslavecfg
lnkdowncableremoved	Link Down - Cable Removed	lnkdowncableremoved **and not** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdeactivated **or** lnkdownmasterslavecfg
lnkdownlpbkfault	Link Down - Loopback Fault	lnkdownlpbkfault **and not** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdeactivated
lnkdownmasterslavecfg	Link Down - Master Slave Config	lnkdownmasterslavecfg **and not** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdeactivated

Table 35: Alarm Masking Rules (Continued)

Condition Type		Alarm Rule
SNMP Alarm Name	**eVision GUI Alarm Name**	
lnkdownunisolated	Link Down - Cause Not Determined	lnkdownunisolated **and not** lnkdownlpbkfault **or** lnkdownautonegfailed **or** lnkdowncablefault **or** lnkdowncableremoved **or** lnkdeactivated **or** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdownmasterslavecfg
qlinvalid	Sync QL Invalid	qlinvalid (no masking)
qlmismatch	Sync QL Mismatch	qlmismatch **and not** qlinvalid
rfi	Remote Fault Indication	rfi **and not** lnkdownunisolated **or** lnkdownlpbkfault **or** lnkdowncableremoved **or** lnkdowncablefault **or** lnkdownautonegfailed **or** lnkdeactivated **or** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdownmasterslavecfg
rxjabber	Receiving Jabber	rxjabber **and not** lnkdownunisolated **or** lnkdownlpbkfault **or** lnkdowncableremoved **or** lnkdowncablefault **or** lnkdownautonegfailed **or** lnkdeactivated **or** SGEO **or** sfpmismatch **or** sfpremoved **or** sfptxfault **or** dyinggasp **or** lnkdownmasterslavecfg
sfpmismatch	SFP - Provisioning Mismatch	sfpmismatch **and not** sfpremoved **or** SGEO
sfpremoved	SFP - Removed	sfpremoved **and not** SGEO
sfptxfault	SFP - Transmit Fault	sfptxfault **and not** sfpmismatch **or** sfpremoved **or** SGEO **or** dyinggasp
syncref	Sync Reference Failed	syncref (no masking)

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Chapter 8

Provisioning Rules

Introduction

The SP-100 is designed for Synchronous Ethernet and cellular backhaul applications to be installed in a remote terminal cabinet.

This chapter provides provisioning rule information for the SP-100. The following is provided:

- Entity State Descriptions
- User Authorization Privilege Levels
- Configuration Settings, Rules and Dependencies
  - “Factory Default Parameters and Maximum Bandwidth” on p. 437
  - “System Configuration Options and Rules” on p. 445
  - “Network Port Configuration Options and Rules” on p. 469
  - “Access Port Configuration Options and Rules” on p. 473
  - “Performance Monitoring Settings” on p. 478
  - “PTP Configuration Options and Rules” on p. 495
  - “SyncJack Configuration Options and Rules” on p. 514
  - “Scheduled SyncJack Activity Settings” on p. 521

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SP-100 Physical Design

Refer to the following for SP-100 component descriptions.

Physical Design

- 2 Combo Opto / Electrical Ethernet Network Ports
- Electrical port supports 10/100/1000bps
- SFP port supports 100/1000bps
- One RJ-45 console port (RS232) for management
- One 10/100Mbps RJ45 Ethernet port for DCN
- One USB2.0 port supporting 3G/LTE interface for backup or DCN access
- SP-100 variant with 2 electrical client ports + SyncE (G.8262) Equipment clock (EEC)
- EEC to meet requirements of both Option 1 and Option 2 as per G.8262
- One T1/E1 timing input connector - front mounted RJ48c
- One T1/E1 timing output connector - front mounted RJ48c
- One GPS Input connector - front mounted SMA - TTL (50 ohm impedance)
- One Time of Day (ToD) - front mounted RJ45 RS422 input / output capable
- One SMB Pulse Per Second (PPS) input - front mounted SMB - 50ohm TTL
- One SMB Pulse Per Second (PPS) input/output - front mounted SMB - 50ohm TTL
- External Frequency Reference Input (CLK) - front mounted SMB
- External Frequency Reference Input/Output (CLK) - front mounted SMB

SP-100 Equipment Configuration Options

- Only one internal open frame PSU is supported.
- The PSU types supported include:
  - AC: 110/220V PSU
  - DC: -48/60V PSU
  - DC: +24V PSU
- Only one PSU is installed per box, so SP-100 does not support a protected PSU configuration of the above PSU types.

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Component Descriptions Common to the SP-100

Refer to the following component descriptions to the SP-100.

Mounting Brackets

The chassis may be positioned as a standalone unit or it may be rack mounted. Adaptation to rack mounting is possible by using mounting brackets and separate removable mounting brackets are available for:

- 19” rack mounting
- 23” ETSI rack mounting
- Recessed rack mounting brackets are also available for 19” and 23” ETSI racks in order to ensure that optical fiber bend radius is maintained when installed in some cabinets with doors.

All brackets are designed to be screwed to the sides of the chassis and the screws supplied have ISO threads.

Cable Handling Rack (Integral)

Cable handling is provided by means of an integral Cable Handling Rack. This is positioned at each PSU chassis and provides a means to fasten the cables.

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Entity State Descriptions

A state model is maintained for each entity in the system. The state of an entity is derived from its Administrative State, its Operational State and its Secondary States.

Administration State

There are a number of rules related to the behavior of the Administrative state as it relates to the parent/child relationship of objects. For example, there are certain states for a child that are 'invalid' if the parent state is not already in that state. The administrative state model consists of the following states:

- **IS (in-service)** - this is the 'normal' state for an entity that is configured to be fully operational
- **Management** - this is also referred to as the “Out of Service” state. In this state, all alarms for the entity is squelched. Any Standing Alarm is cleared and re-raised as a not-alarmed (NA) Condition. The intended use of this state is to squelch alarms that the user is not interested in. In addition, for any 'traffic affecting' provisioning change, the entity is put into this state (although there is no enforcement of this requirement). The additional characteristics associated with this state is that user data and management traffic continue to flow.
- **Maintenance** - this is ALSO an “Out of Service” state (i.e., it inherits the properties described above). The additional characteristics associated with this state is that 'maintenance' operations are allowed to be performed against an entity in this state which may affect user data or management data. Maintenance state operations include things like: Loopback, Etherjack diagnostic, etc.
- **Disabled** - this is ALSO an “Out of Service” state (i.e., it inherits the properties described above). The additional characteristics associated with an entity in this state is that no user data traffic passes. The intended use of this state is to allow the user traffic to be 'disabled' while still preserving management connectivity with the entity.
- **Unassigned** - this state is essentially equivalent to an entity being 'deleted'. An entity in this state is not factored into any of the rules checking and will not be alarmed or carry traffic. The Administrative State must first be set to Unassigned state prior to changing the Service Type of a Network Port or Access Port.

Administration State Model Details

It should be noted that the Management, Maintenance and Disabled state are ALL members of the “Out-Of-Service” (OOS) state. An entity transitional between any of these three states does not have any impact on it's Parent or Child entities.

- The equipment Administrative state model will only utilize the In-service and Management states

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- When in the Management or Maintenance state, all alarms against that entity is suppressed. The entity will otherwise function as normal.
- When in the Disabled state, user data traffic is suppressed.
- In order to perform maintenance actions on an entity (e.g., Loopback, Diagnostics, etc.) the entity must first be put into the Maintenance state.
- An entity in the Disabled state will not pass user data traffic. Management traffic (i.e.. Management Tunnel traffic and EFM OAM) will continue to pass in this state.
- The Operational State of an entity can be either:
    - Normal
    - Outage
        - The Operational state of an entity is Outage when:
            - Admin state of the entity is Unassigned
            - Secondary state is FAF, FLT, SGEO, UEQ, MEA
- The facility Administrative state model will utilize all states described above. The exception to this is the following:
    - The Disabled State only applies to Access Ports.
    - Network Ports do not support the Disabled state. In regards to Network Ports, the Unassigned State does not apply to the working Network port.
    - The working Network port cannot be Unassigned.
- The DCN facility Administrative state model is limited to the following states:
    - In-service
    - Management
    - Unassigned
- EVC (Flows), Policers and Shapers support the following states:
    - In-service
    - Management
    - Disabled
    - Unassigned

EVC (Flows) - Admin state control between In-service and Management is supported. Disabled and Unassigned is derived from the parent port. Policers and Shapers - Admin state is read-only. State is ALWAYS derived from parent EVC.

Users may edit the state of the Equipment, Port and EVC (Flow). The Policer and Shaper states are derived directly from the EVC (Flow) state. Editing the EVC state is allowed according to the rules outlined below. Note that the state of the individual EVC can be overwritten by a subsequent edit of the parent Port object (see behavior rules defined below).

Parent/Child rules for Equipment entities:

- If an Equipment entity is In-service, its child entities Port entities can be any state (supported by that entity).
- If an Equipment entity is Management, its child entities can be any “Out of Service” state or Unassigned.
- If an Equipment entity is Unassigned, its child entities must be unassigned.

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Parent/Child rules for Port entities:

- If a Port Entity is in In-Service state, its child entities (EVCs) can be in In-Service, Management or Unassigned state.
- If a Port Entity is in Management, Maintenance or Disabled state, its child entities can be in Management or Unassigned state
- If a Port Entity is in Unassigned state, its child entities must be in Unassigned state.

Parent/Child rules for EVC (Flow) entities. Note that child entities of EVCs are not user editable.

- If an EVC Entity is in In-Service state, its child entities (policers, shapers) is in In-Service.
- If an EVC Entity is in Management state, its child entities is in Management.
- If an EVC Entity is in Unassigned state, its child entities is in Unassigned state.

Changing the Equipment entity state from In-Service to Management will have the side-effect of changing the Port state from In-Service to Management. Any Port that was already in an OOS state (i.e. Management, Maintenance or Disabled) will stay in that state. Any Port that was already in the Unassigned state will stay in the Unassigned state.

Changing an Equipment entity from Management to In-service will NOT have any side-effect on the Port state. The Port state will remain as it was.

Due to the many-to-one relationship between Port entities and EVCs (Flows), the following behaviors is implemented:

- editing a Port entity from In-service to Management, Maintenance or Disabled will result in ALL EVCs (Flows) that are children of that Port being changed from In-service to Management. If an EVC was already Management or Unassigned prior to the edit of the Port state, it will not change.
- editing a Port entity from In-service, Management, Maintenance or Disabled to Unassigned will result in ALL EVCs (Flows) that are children of that Port being changed to Unassigned.

Note

This effect will also occur as a result of an edit of the Port's parent entity. For example, if the Equipment entity state is edited in such a way that it affects the Port's Administration state, the above rules will apply such that the effect is propagated to the Port's child entities also.

Due to the many-to-one relationship between Port entities and EVCs (Flows), the following behaviors is implemented:

- editing a Port entity from Management, Maintenance or Disabled to In-Service will result in ALL EVCs (Flows) that are children of that Port being changed from Management to In-Service. If an EVC was Unassigned prior to the edit of the Port state, it will remain Unassigned.
- editing a Port entity from Unassigned to Management, Maintenance or Disabled will result in ALL EVCs (Flows) that are children of that Port being changed to Management.

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- editing a Port entity from Unassigned to In-Service will result in ALL EVCs (Flows) that are children of that Port being changed to In-Service.
- editing a Port entity from Unassigned to Disabled will result in ALL EVCs (Flows) that are children of that Port being changed to In-Service.

Note

This effect will also occur as a result of an edit of the EVC's parent entity. For example, if the Port entity state is edited in such a way that it affects the EVC's Admin state, the above rules will apply such that the effect is propagated to the EVC's child entities also.

Operational State

This attribute contains the current actual state of the entity. It is based on the provisioned state plus the actual physical state of the entity.

Secondary State

This attribute refines or provides added information regarding the Operational State of the entity.

Refer to the following table for state values and their definitions.

Table 36: State Codes and Descriptions

State Entity	State	Definition
Administration State - Equipment and Facilities	Disabled	User Traffic is not passed in this state; management traffic is passed. Alarms are squelched in this state.
	IS	Normal, in-service, traffic passing state of the entity.
	Maintenance	Mandatory state for initiating loopbacks, Etherjack® Diagnosis. Alarms are squelched in this state.
	Management	“Out-Of-Service” state of entity, traffic is still passed, alarms are squelched (i.e., not reported).
	Unassigned	Traffic (user or management) not passed in this state. Alarms are not monitored in this state.
Operational State - Equipment and Facilities	Normal	Normal, in service, traffic passing state of the entity.
	Outage	The entity is not operational, due to alarm condition.

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Table 36: State Codes and Descriptions (Continued)

State Entity	State	Definition
Secondary States - Equipment and Facilities	ACT	Entity is active.
	AINS	Automatic in-service.
	DSBLD	Disabled
	FAF	Facility failure.
	FLT	Fault detected.
	LPBK	Loopback state.
	MAINT	Maintenance state.
	MEA	Mismatched equipment.
	STBY	Standby hot.
	SGEO	Supported entity outage.
	UAS	Unassigned.
	UEQ	Unequipped.
OAM Administration State	Disabled	Disabled.
	Enabled	Enabled.
OAM Discovery State	Active Send Local	Active send local.
	Fault	Fault detected.
	Passive Wait	Passive wait.
	Send Any	Send any.
	Send Local/Remote	Send local/remote.
	Send Local/Remote OK	Send local/remote OK.
File Services Status	Cannot revert	Cannot revert.
	Failure	Failure.
	File not found	File not found.
	In progress	In progress.
	Install failed	Installation failed.
	Invalid file type	Invalid file type.
	Login failed	Login failed.
	No backup database	There is no backup database.
	No space left	No disk space left.
	No software to install	There is no software to install.
	Permission denied	Permission denied.
	Revert failed	Revert failed.
	Server unreachable	Server unreachable.
	Success	Successful completion.
	Software not installed	Software not installed.
	Upgrade failed	Upgrade failed.
	Validation timer not active	Validation timer not active.

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Table 36: State Codes and Descriptions (Continued)

State Entity	State	Definition
Database or Upgrade Current State	Database Backup	Database backup.
	Database Download	Database download.
	Database Restore	Database restore.
	Database Upload	Database upload.
	Idle	Idle.
	Rebooting	Rebooting.
	Software Cancel Upgrade	Software cancel upgrade.
	Software Download	Software download.
	Software Install	Software install.
	Software Upgrade	Software upgrade.
	Software Validate	Software validate.
	Software Revert	Software revert.
Protection Group Status	FORCED PROTECT	Forced to Protect.
	FORCED WORKING	Forced to Working.
	LOCKOUT PROTECT	Lockout to Protect.
	MANUAL PROTECT	Manual to Protect.
	MANUAL WORKING	Manual to Working.
	NO OUTSTANDING REQUEST	There is no outstanding request.
	SD PROTECT	Signal Degrade on Protect.
	SD WORKING	Signal Degrade on Working.
	SF PROTECT	Signal Failure on Protect.
	SF WORKING	Signal Failure on Working.
	WAIT TO RESTORE	Wait to restore.
Protection Unit State	Active	Indicates this is the active unit.
	Standby	Indicates this is the standby unit.
Test Status (Diagnostics)	Aborted	Test has been aborted.
	Completed	Test has completed.
	Initial	Test is initiating.
	In-progress	Test is in-progress.
	Stopped	Test has been manually stopped.

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User Authorization Privilege Levels

Refer to the following table for user authorization privilege levels.

Table 37: User Authorization Privilege Levels

User Level	Description
Superuser	Has access to all commands, including administration commands.
Provisioning	Has access to all commands with the exception of other user administration options.
Maintenance	Has access to a limited set of commands which support maintenance actions, such as testing, loopbacks, diagnostics.
Retrieve	Has access to commands for displaying configuration settings and performance data.

Configuration Settings, Rules and Dependencies

The following provides a summary of configuration default settings, configuration options, provisioning rules and dependencies.

The following configuration options and rules tables provide high level option descriptions and valid entries using the eVision web browser management tool. The high level option descriptions provided here assume a good working knowledge of the use of each option, and are intended to be used as a guide to operate, configure and maintain the system. Additional information for each option description can be found in the *FSP 150SP-100 Command Line Reference Guide* for specific features. For more information regarding navigating and using the eVision, see Chapter 3: eVision Web Browser Management Tool.

This section provides the following configuration settings information:

- "Factory Default Parameters and Maximum Bandwidth" on p. 437
- "System Configuration Options and Rules" on p. 445
- "Network Port Configuration Options and Rules" on p. 469
- "Access Port Configuration Options and Rules" on p. 473
- "Performance Monitoring Settings" on p. 478
- "PTP Configuration Options and Rules" on p. 495
- "SyncJack Configuration Options and Rules" on p. 514
- "Scheduled SyncJack Activity Settings" on p. 521

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Factory Default Parameters and Maximum Bandwidth

When the database of the FSP 150SP is modified, it stores the changes in non-volatile memory. If a power loss / system reboot occur, all configuration data is retained. There are three versions of the database always resident on the system, plus a “standby” copy of the current database. The three versions are the current running configuration, System Default (a copy that may be modified by a user) and Factory Default (a copy that cannot be modified). When first commissioned, these three database versions are identical. As provisioning occurs, the current running configuration database is updated with each change entered.

Refer to Table 38 on p. 437 for ADVA Optical Networking “factory default” configuration settings. Each functional area and default configuration settings are shown in order, as seen when using the eVision web browser management tool. Refer to Table 39 on p. 444 for Network port maximum bandwidth, Access port maximum bandwidth and default Access port CIR/PIR values. For default TCA settings, refer to “Performance Monitoring Settings” on p. 478.

Table 38: Factory Default Configuration Settings

Functional Area / Entity		Parameter	Default Setting
System	System Configuration	CLI Prefix	ADVA
		Provisioning Mode	Autoprov
		Management Traffic Bridging	Disabled
		Mgmt Traffic Bridging Security	Disabled
		Proxy ARP	Disabled
		Date/Time	(variable)
		FTP	Disabled
		HTTP	Enabled
		HTTPS	Enabled
		SSL Cipher Strength	Low
		SCP	Enabled
		Serial Port	Enabled
		Serial Port Auto Log Off	Enabled
		SFTP	Enabled
		SSH	Enabled
		Telnet	Disabled
		Authentication Traps	Disabled
		CLI Security Prompt	Disabled
		SNMP Engine ID	12 Octets (variable)
	Security Log	Syslog	Disabled
	Alarm Log	Syslog	Disabled
		Local Logging	Enabled
	Audit Log	Syslog	Disabled
		Local Logging	Enabled

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Table 38: Factory Default Configuration Settings (Continued)

Functional Area / Entity		Parameter	Default Setting
System (Continued)	Syslog	Log Server 1, 2, 3 IP Address	0.0.0.0
		Log Server 1, 2, 3 Port	514
	Access Control List (ACL) (Entries 1-10)	Network Address	0.0.0.0
		Network Mask	255.255.255.255
		Control	Disabled
	Banner	Security Banner	This is a private system. Unauthorized access or use may lead to prosecution.
	NTP	State	Disabled
		Polling Interval (seconds)	16
		Primary Server	0.0.0.0
		Backup Server	0.0.0.0
		Active Server	Primary
NTE (NE-1 / NTESP100)	NE Configuration (NE-1)	Name	FSP150SP-100
		Location	(blank)
		Contact	(blank)
		CLI Prefix	NE-1
		Administrative State	IS
	NTESP100 Configuration	Alias	(blank)
		Administrative State	IS
		SNMP Dying Gasp	Disabled
	E1000 Network Port Facilities (E1000-N-1)	Alias	(blank)
		Administrative State	Management
		Media Type	Copper
		MTU Size	9612 (bytes)
		Configured Speed	Auto 1000 Full
		MDIX	Auto[2]
		Auto Diagnostic	Enabled
		Drop Eligibility Indicator	Enabled
		Port Shaping	Disabled
		Port Shaped Speed	0 (bps)
		Q in Q Ethertype	88a8 (hex)
		Q in Q Ethertype Override	Disabled
		Sync-E Mode	Disabled
		QL-Mode	Disabled
		Assumed QL	QL-EEC1
		Expected QL	QL-NONE

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Table 38: Factory Default Configuration Settings (Continued)

Functional Area / Entity		Parameter	Default Setting
NTE (NE-1 / NTESP100 (Continued)	Ethernet Access Port Facility (E1000-A-1)	Alias	(blank)
		Administrative State	Unassigned
		Media Type	Copper [1]
		MTU Size	9600
		Configured Speed	Copper = Auto, Fiber = 100 Full
		MDIX	Auto[2]
		Auto Diagnostic	Enabled
		Port Mode	CO (Connection-Oriented)
		Service Type	EPL
		AFP	AFP ALL
		Q in Q Ethertype	8100 (hex)
		Q in Q Ethertype Override	Enabled
		Port Shaped Speed	0 (bps)
		Sync-E Mode	Disabled
		QL-Mode	Disabled
		Assumed QL	QL-EEC1
		Expected QL	QL-NONE
	DCN (eth0)	Alias	(blank)
		Administrative State	IS
		Configured Speed	Auto
		MDIX	Auto
	3G Modem	Alias	(blank)
		Administrative State	IS
		3G Dial-Up APN	(blank)
		3G Dial-Up User Name	(blank)
		3G Dial-Up Password	(blank)
		3G Dial-Up Dial#	Not Available
		3G Dial-Up Redial Timer	10 (Sec)
		PIN Enable/Disable/Change/ Authenticate/Unlock	(blank)

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Table 38: Factory Default Configuration Settings (Continued)

Functional Area / Entity		Parameter	Default Setting
Synchronization	SYNC-1-1-1-1	Alias	(blank)
		Administrative State	IS
		Network Clock Type	Option-1-SDH Regional Clock
		WTR Time	5 (minutes)
		Selection Mode	Priority Mode
		Add/Edit/Delete Sync Reference	(No Sync References Exist at System Default)
	BITS-1 BITS IN	Alias	(blank)
		Administrative State	Unassigned
		Line Type	E1
		Line Code	E1 HDB3
		Frame Format	E1 CRC4
		SA Bit	Bit 4
		QL Mode	Disabled
		Assumed QL	QL-EEC1
		Expected QL	QL-NONE
	BITS-1 BITS-OUT	Alias	(blank)
		Administrative State	Unassigned
		Line Type	E1
		Line Code	E1 HDB3
		Frame Format	E1 CRC4
		SA Bit	Bit 4
		QL Mode	Disabled
		Squelch QL	QL-NONE
		Line Build Out	None
	CLK-1-1-1-1 (In)	Alias	(blank)
		Administrative State	Unassigned
		Signal Direction	Input
		Squelch Control	Never
		Squelch QL	QL-NONE
		Assumed QL	QL-EEC1
	CLK-1-1-1-2	Alias	(blank)
		Administrative State	Unassigned
		Signal Direction	Output
		Squelch Control	Never
		Squelch QL	QL-NONE
		Assumed QL	QL-EEC1

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Table 38: Factory Default Configuration Settings (Continued)

Functional Area / Entity		Parameter	Default Setting
Synchronization (Continued)	PPS-1-1-1-1 (In)	Alias	(blank)
		Administrative State	Unassigned
		Signal Direction	Input
		Squelch Control	Lock
		Input Rate	Pulse Per Second
		Delay Compensation	0
	PPS-1-1-1-2	Alias	(blank)
		Administrative State	Unassigned
		Signal Direction	Output
		Squelch Control	Never
		Input Rate	Pulse Per Second
		Delay Compensation	0
	TOD-1-1-1-1	Alias	(blank)
		Administrative State	Unassigned
		Squelch Control	Never
	GPS-1-1-1-1	Alias	(blank)
		Administrative State	Unassigned
		PPS generation condition	1SAT
		Antenna Cable Length (meters)	0
Communications	DCN (eth0)	IP Address	192.168.0.2
		Net Mask	255.255.255.0
		RIPv2	Disabled
		DHCP	Disabled
		DHCP Role	DHCP Client
		DHCP Client ID Control	Disabled
		DHCP Client ID	(System Name)
		Edit System Default Gateway	Not selected (Empty)
		Gateway IP Address	192.168.0.0
	3G DCN	Name	cellular
		IP Address	0.0.0.0
		Subnet Mask	0.0.0.0
		MTU	0
		DNS 1	0.0.0.0
		DNS 2	0.0.0.0
	Management Tunnels	(None Created)	(None Created)

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Table 38: Factory Default Configuration Settings (Continued)

Functional Area / Entity		Parameter	Default Setting
SNMP	Communities	Community Names	public, private
		Access Type	read-only (public) read-write (private)
	Target Addresses	Target Addresses	(None Exist at System Defaults)
	Target Parameters	Target Parameters	(None Exist at System Defaults)
	USM Users	SNMP User ADMIN	
		User Name	ADMIN
		Engine ID	local
		Security Name	ADMIN
		Security Level	No Authentication
		User Access Type	Read/Write
		Authentication Protocol	None
		Privacy Protocol	None
		SNMP User MONITOR	
		User Name	MONITOR
		Engine ID	local
		Security Name	MONITOR
		Security Level	No Authentication
		User Access Type	Read/Write
		Authentication Protocol	None
		Privacy Protocol	None
		SNMP User OPERATOR	
		User Name	OPERATOR
		Engine ID	local
		Security Name	OPERATOR
		Security Level	No Authentication
		User Access Type	Read/Write
		Authentication Protocol	None
		Privacy Protocol	None
		SNMP User PROVISION	
		User Name	PROVISION
		Engine ID	local
		Security Name	PROVISION
		Security Level	No Authentication
		User Access Type	Read/Write
		Authentication Protocol	None
		Privacy Protocol	None
	SNMP Dying Gasp	SNMP Dying Gasp	(no target addresses are provisioned, thus this option is disabled)

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Table 38: Factory Default Configuration Settings (Continued)

Functional Area / Entity		Parameter	Default Setting
Administration	Local Users	Local User netadmin	
		User Name	netadmin
		Password	ChgMeNOW
		Privilege	Provisioning
		CLI Paging	Enabled
		Comment	Default User
		Login Timeout	15 (minutes)
		Local User root	
		User Name	root
		Password	ChgMeNOW
		Privilege	Superuser
		CLI Paging	Disabled
		Comment	Default User
		Login Timeout	15 (minutes)
		Local User user	
		User Name	user
		Password	ChgMeNOW
		Privilege	Maintenance
		CLI Paging	Disabled
		Comment	Default User
		Login Timeout	15 (minutes)
	Remote Users	No remote user entries are entered at default	N/A
	Remote Authentication	Authentication Protocol	None
		Authorization Type	PAP
		Access Order	Local
		TACACS Privilege Control	Enabled
		TACACS Default Privilege	N/A
		NAS IP Address	0.0.0.0
		Accounting	Disabled
		Remote Authentication Servers 1-3	Disabled
	Security Policy	Policy Strength	High
	Key Generation: Edit SSL Certificate Data	Country	US
		State	Texas
		Locality	Richardson
		Organization	ADVA Optical Networking
		Organization Unit	Metro Ethernet Access
		Name	ADVA Optical Networking
		Email	support@advaoptical.com
		Valid Until	varies (yyyy-mm-dd)

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1. E1000 Access and Network Port Media Type is Copper, Copper SFP or Fiber.
2. MDIX for Media Type ‘Copper’ or ‘Copper SFP’. If Media Type is ‘Fiber’, MDIX is ‘Not Applicable’.

Table 39: Maximum Network Port/Access Port Bandwidth

Port Type	Associated EID	Max. CIR	Max. EIR
E1000 (Fiber, Copper SFP or Copper):	NETWORK PORT-1-1-1-1	1000000000 (bps)	8000000000 (bps)
E1000 (Fiber, Copper SFP or Copper):	ACCESS PORT-1-1-1-1	1000000000 (bps)	8000000000 (bps)

Note

All maximum values shown in the above table are indicative of a port without a management tunnel, which utilizes a configurable amount of bandwidth. At default configuration, no management tunnels are provisioned.

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System Configuration Options and Rules

Refer to the following table for System configuration settings and associated rules when using the eVision web browser. Default settings are identified in bold. The following editable system settings are shown in order, as seen when using the eVision web browser management tool in Configuration mode.

System configuration options and rules consist of the following entities, which are provided in Table 40 on p. 445:

- System Configuration
- Network Element (NE-1) Configuration
- NTESP100 Configuration
- Synchronization
- Communications
- SNMP
- Administration

Table 40: System Configuration Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
System Configuration		
System (Edit System)		
CLI Prefix	When using CLI, this string is displayed at the highest level prompt after logon. This string can be up to 64 printable ASCII characters long, but cannot use the “space” character.	**ADVA**
Provisioning Mode	For SP-100, this feature has no effect on normal operation. The user should not modify the default setting.	**Autoprov** Autoprov Off Autoprov Confirm
Management Traffic Bridging	This option is used to enable the management traffic bridging feature. When bridging is disabled, existing http, https, telnet, and ssh sessions are unresponsive for up to 3 seconds. When bridging is enabled, existing http, https, telnet, and ssh sessions are unresponsive for up to 10 seconds	**Disabled** Enabled
Mgmt Traffic Bridging Security	This option limits acceptance of DCN packets to those with an ADVA OUI in the source MAC (00:80:EA:XX:XX:XX, 00:0B:90:XX:XX:XX, or 00:D0:8B:XX:XX:XX). This option is only available if Management Traffic Bridging is enabled.	**Disabled** Enabled

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Proxy ARP	This option defines if the proxy ARP functionality should be enabled. If two or more ADVA Optical Networking FSP 150s are connected via Management Tunnel as well as connected to the same LAN, then only one of the NEs/NIDs should have the PROXYARP option enabled. Otherwise, there will be multiple ARP responses for a single ARP request for a remote reachable IP Address.	**Disabled** Enabled
Date/Time	The date in format: yyyy-mm-dd and the time in format: hh:mm:ss. If Unicast is selected for NTP Mode and an NTP server has been linked, changing the date and time is denied. If a date/time entered exceeds the provisioned user GUI timeout value in respect to the current system time, then the user session will time out.	(varies)
System Time of Day	Selects the desired system Time of Day mode. • Local: the Time of Day is based on the local oscillator. • NTP: the Time of Day is updated based on an external NTP server. • PTP Clock: the Time of Day is updated based on the Telecom Slave's Time of Day. (PTP Clock is only applicable when a Telecom Slave has been provisioned.)	**Local** NTP PTP Clock
Source TOD Clock	Selects the source TOD Clock (TS-1-1 if provisioned). A drop-down list is provided that contains all configured TOD clock sources.	**None Configured** TS-1-1
FTP	Enables or disables File Transfer Protocol access to the system. If enabled, the FTP client on the system can be used for file transfer.	Enabled **Disabled**
HTTP	Enables or disables Hypertext Transfer Protocol access to the system. If enabled, the user can access the GUI interface using HTTP. Note: HTTP is an unsecured protocol. Using this protocol to access the system could compromise the security of the system.	**Enabled** Disabled
HTTPS	Enables or disables Hypertext Transfer Protocol Secure access to the system. If enabled, the user can access the GUI interface using HTTPS.	**Enabled** Disabled

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
SSL Cipher Strength	Sets the strength of the SSL cipher. Encryption strength is measured in key length – number of bits in the key. To decipher an SSL communication, one needs to generate the correct decoding key. Mathematically speaking, 2^n possible values exist for an n-bit key. Thus, 40-bit encryption (low) involves 2^{40} possible values, 56-bit encryption (medium) involves 2^{56} combinations, and 128-bit encryption (high) 2^{128} possible combinations. Changing the SSL strength setting results in disconnecting all active web access users, requiring them to re-login.	**Low** Medium High
SCP	Enables or disables Secure Copy Protocol access to the system. If enabled, SCP can be used for file transfer.	**Enabled** Disabled
Serial Port	Enables or disables RS-232 serial port access to the system.	**Enabled** Disabled
Serial Port Auto Log Off	If Enabled, causes Auto Logoff of the user session on the serial port, when the serial port is disconnected.	**Enabled** Disabled
SFTP	Enables or disables Secure File Transfer Protocol access to the system. If enabled, SFTP can be used for file transfer.	**Enabled** Disabled
SSH	Enables or disables Secure Shell (TCP/UDP port 22) access to the system. If enabled, the user can access the system through an SSH connection.	**Enabled** Disabled
Telnet	Enables or disables Telnet (TCP port 23) access to the system. If enabled, the user can access the system through a telnet connection. Note: Telnet is an unsecure protocol. Use of this protocol can have an impact on the security of the system.	**Enabled** Disabled
Authentication Traps	Enables or disables SNMP Authentication Traps. If enabled, SNMP Authentication traps will be sent to the configured trap host.	Enabled **Disabled**
CLI Security Prompt	Enables or disables the following CLI security prompt: ********** This is a private system. Unauthorized access or use may lead to prosecution. ********** Do you wish to continue [Y|N]-->	**Enabled** Disabled
SNMP Engine ID	Allows the user to edit the SNMP Engine ID which consists of 22 Hexadecimal characters.	0xhhhhhhhhhhhhhhhhhhhhhh

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Security Log (Edit Security Log)		
Syslog	Enable or Disable logging of security related activity to the Syslog server.	**Disabled** Enabled
Alarm Log (Edit Alarm Log)		
Syslog	Enable or Disable logging of alarm activity to the Syslog server.	**Disabled** Enabled
Local Logging	Enables or Disables sending Alarm messages to the local log. If set to Enabled, view logs by selecting the Alarm Log tab.	**Enabled** Disabled
Audit Log (Edit Audit Log)		
Syslog	Enable or Disable logging of audit related activity to the Syslog server.	**Disable** Enable
Local Logging	Enables or Disables sending Audit messages to the local log. If set to Enabled, view logs by selecting the Audit Log tab.	**Enabled** Disabled
Syslog (Edit Syslog)		
IP Address	IP Address of a Syslog Server. Entering an IP address enables transmission of alarm information to a Syslog Server. Up to three Syslog Servers can be configured. All syslog messages generated by the unit are sent to all configured Syslog Servers. Setting the IP Address to 0.0.0.0 will result in the server not being used.	**0.0.0.0**
Port	The IP port of each registered Syslog Server. The default port number is 514.	**514**
Access Control List (Edit ACL for ACL ID 1 through 10)		
Network Address	IP Address of the user/subnet allowed to access the SP-100. Up to 10 user/subnetwork IP addresses can be entered (ACL ID 1-10).	**0.0.0.0**
Network Mask	Network Mask for the user/subnet IP address allowed to access the SP-100. Up to 10 user/subnetwork IP address and Network Mask combinations can be entered (ACL ID 1-10).	**255.255.255.255**
Control	Each Network Address/Network Mask combination can be Enabled or Disabled. The default is Disabled. Enabling an entry applies it to every management interface with ACL enabled.	Enabled **Disabled**
Security Banner (Edit Banner)		
Banner	Defines a custom security banner (a text string of up to 2000 characters in length) which is displayed when a user logs onto the system. This banner is displayed on CLI and web browser logins.	**This is a private system. Unauthorized access or use may lead to prosecution.**

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
NTP (Edit NTP)		
State	This option is used to enable or disable the Network Time Protocol Client. Enabling NTP causes a Unicast (point-to-point) request to a server IP address and expects a reply indicating the time. Up to two IP addresses can be provisioned.	Enabled
		Disabled
Primary Server	This option is used to configure the IP address of the primary NTP Server. Setting this address to 0.0.0.0 disables this server from being used. Only applicable if NTP State is Enabled.	**0.0.0.0**
Backup Server	This option is used to configure the IP address of the backup NTP Server. Setting this address to 0.0.0.0 disables this server from being used. Only applicable if NTP State is Enabled.	**0.0.0.0**
Polling Interval	Set the NTP polling interval in seconds. Allowed settings are from 16 to 1024 seconds as powers of 2 (16, 32, 64, 128, 256, 512, 1024). Default is 16.	**16**
Active Server	If both Primary and Backup Server IP Addresses are configured, the user can switch between them using this setting. Only applicable if NTP State is Enabled.	**Primary**
		Backup
Restore System Defaults		
Restore System Defaults	Allows the user to reset the NE back to system defaults. NOTE: This may cause the loss of all traffic, user data and DCN communications settings. This should only be done when re-configuring or relocating the NE, or as a last resort when troubleshooting traffic or communications problems.	OK
		Cancel
Network Element (NE-1) Configuration		
NE-1 (Edit)		
Name	This is a text string containing a meaningful description of the NE. The NE Name must start with a letter, end with a letter or digit, and have as interior characters only letters, digits, and hyphens. Maximum length is 256 characters. Upper and lower case characters are allowed.	up to 256 characters **FSP150SP-100**
Location	This is a text string entry that should specify where the system is located with enough detail so that operations personnel can easily locate the device. Maximum length is 256 characters.	up to 256 characters **(blank)**
Contact	This is a text string entry that should specify the name and contact information of the individual responsible for the administration of the system. Maximum length is 256 characters.	up to 256 characters **(blank)**

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
CLI Prefix	When using CLI, this string is displayed when navigating to the Network Element level menu. This string can be up to 64 printable ASCII characters long, but cannot use the “space” character.	up to 64 characters **NE-1**
Administrative State	Defines the NE administrative state. IS is In Service and is the default value. See “Entity State Descriptions” on p. 430.	**IS** Management
NTESP100 Configuration		
NTESP100 (Edit)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the SP-100 administrative state. IS is In Service and is the default value. See “Entity State Descriptions” on p. 430.	**IS** Management
SNMP Dying Gasp	Enables or disables dying gasp message via SNMP. When enabled, OAM dying gasp messages are sent on EFM-enabled interfaces.	Enabled **Disabled**
Network Ports and Access Ports		
See “Network Port Configuration Options and Rules” on p. 469 and “Access Port Configuration Options and Rules” on p. 473.		
DCN (eth0) (Edit Configuration)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Enables or disables the Data Communications Network. IS is In Service and is the default value. See “Entity State Descriptions” on p. 430.	**IS** Management Unassigned
Configured Speed	Defines the line rate of the port and whether it is in half duplex or full duplex mode.	**Auto** Auto 100 Full Auto 100 Half Auto 10 Full Auto 10 Half 100 Full 100 Half 10 Full 10 Half
MDIX	Defines the Media Dependent Interface, Crossover function for copper interfaces. MDIX allows the interface to change cable signal assignments to compensate for using the incorrect cable type.	**Auto** Crossed Uncrossed

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
3G Modem (Edit Configuration)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the SYNC administrative state. IS is In Service and is the default value. See "Entity State Descriptions" on p. 430.	**IS** Management Unassigned
APN	3G Modem Dial-Up Configuration setting.	**(blank)**
User Name	3G Modem Dial-Up Configuration setting.	**(blank)**
Password	3G Modem Dial-Up Configuration setting.	**(blank)**
Dial #	3G Modem Dial-Up Configuration setting.	**(blank)**
Redial Timer	3G Modem Dial-Up Configuration setting. in seconds	**10**
3G Modem (Enable PIN)		
Input PIN	3G Modem Dial-Up Configuration setting.	**(blank)**
3G Modem (Disable PIN)		
Input PIN	3G Modem Dial-Up Configuration setting.	**(blank)**
3G Modem (Change PIN)		
Current PIN	3G Modem Dial-Up Configuration setting.	**(blank)**
New PIN	3G Modem Dial-Up Configuration setting.	**(blank)**
Confirm New PIN	3G Modem Dial-Up Configuration setting.	**(blank)**
3G Modem (PIN Authentication)		
Input PIN	3G Modem Dial-Up Configuration setting.	**(blank)**
3G Modem (Unlock with PUK)		
Input PUK	3G Modem Dial-Up Configuration setting.	**(blank)**
New PIN	3G Modem Dial-Up Configuration setting.	**(blank)**
Confirm New PIN	3G Modem Dial-Up Configuration setting.	**(blank)**
Synchronization		
NE-1		
NTESP100		
SYNC-1-1-1-1 (Edit Sync)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the SYNC administrative state. IS is In Service and is the default value. See "Entity State Descriptions" on p. 430.	**IS** Management

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Network Clock Type	Defines the network clock type. If a 2048kHz or E1 is the desired BITS Line Type, then Network Clock Type should be set to “Option 1". If a T1 is the desired BITS Line Type, then Network Clock Type should be set to “Option 2". AIS or LOF will be detected at the BITS interface endpoints if mismatches of the SP-100's Network Clock Type and the SP-100's line-type are provisioned.	**Option 1-SDH Regional Clock**
		Option 2-SONET Regional Clock
WTR Time	Time delay in minutes from the recovery of a clock source to its restoral as usable in an active state.	0-12 **5**
Selection Mode	Defines what system is used to select the active clock source.	**Priority Mode**
		QL Mode
SYNC-1-1-1-1 (Add Sync Reference)		
SYNCREF Index	Unique identifier of a sync reference entity. While the Syncref Index is automatically indexed as sync references are added, a dropdown list of available indexes is provided for the user to select the desired one.	1-2 **1**
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Priority	Sets the priority for a sync reference. If the Selection Mode is set to ‘Priority Mode’ this setting is used to determine the sync reference hierarchy.	1-10 **1**
Sync Reference Sources	Dropdown list of available sync references. The Network Port, Access Port (including Line Card Ports) or BITS-IN has to be configured for Sync-E operation and be in a proper admin state to appear on the dropdown list.	(drop down list of provisioned Sync Reference sources)
SYNC-1-1-1-1 (Edit Sync Reference) ***Note**: A valid Sync Reference source must first be configured and In Service prior to adding a Sync Reference.*		
Select Ref	When BITS-IN, a Network Port or Access Port has been added as a Sync Reference, their interface becomes available to choose from the menu list by selecting its radio button to edit Priority and/or Alias.	(drop down list of provisioned Sync Reference sources)
Priority	If a displayed Sync Ref Eid has its Select Ref radio button selected, the user can select a new Priority from the dropdown list.	1-10
Alias	If a displayed Sync Ref Eid has its Select Ref radio button selected, the user can edit the text and/or number string to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
SYNC-1-1-1-1 (Delete Sync Reference)		
Select Ref	When a Network Port, Access Port, PWE3 Facility, Telecom Slave or BITS-IN has been added as a Sync Reference, their interface becomes available to delete from the reference list by selecting its radio button.	(drop down list of provisioned Sync Reference sources)
TIME CLOCK-1-1-1-1 (Edit Time Clock)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the Time Clock administrative state. IS is In Service and is the default value. See "Entity State Descriptions" on p. 430.	IS **Management**
WTR Time	Time delay in minutes from the recovery of a clock source to its restoral as usable in an active state.	0-12 **5**
Selection Mode	Defines what system is used to select the active clock source.	**Priority Mode** QL Mode
Time Holdover Performance (ns)	Time Holdover Performance (in nanoseconds).	**500** 1000 1500 5000 10000
Sync Ref Candidate	Enable/disable as a Sync Reference Candidate.	**Enabled** Disabled
Expected QL	Set the Expected Quality Level. If Line Type is set to 2048 kHz, then this option is not applicable.	**QL-NONE** QL-PRC QL-SSU-A QL-SSU-B QL-EEC1
TIME CLOCK-1-1-1-1 (Add Time Clock Reference)		
TimeREF Index	Time reference index.	(drop down list)
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Priority	Sets the priority for this Time Clock Reference.	**1**-10
Time Clock Reference Sources	Selects the Time Clock Reference Source.	(drop down list of provisioned Time Clock Reference sources)
TIME CLOCK-1-1-1-1 (Edit Time Clock Reference)		
Select Ref radio button	Select the radio button for the corresponding Time Clock Reference to be edited.	radio button
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Priority	Sets the priority for this Time Clock Reference.	**1**-10
TIME CLOCK-1-1-1-1 (Delete Time Clock Reference)		
Select Ref radio button	Select the radio button for the corresponding Time Clock Reference to be deleted.	radio button
BITS-1		
BITS-IN (Edit Configuration)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the SYNC administrative state. See “Entity State Descriptions” on p. 430. BITS will not show up as a potential synchronization reference if the administration state is set to Unassigned.	**Unassigned** IS Management
Line Type	Sets the BITS line type. If a 2048kHz or E1 is the desired BITS Line Type, then Network Clock Type should be set to “Option 1". If a T1 is the desired BITS Line Type, then Network Clock Type should be set to “Option 2". AIS or LOF will be detected at the BITS interface endpoints if mismatches of the FSP 150SP's Network Clock Type and the FSP 150SP's line-type are provisioned. Line Type should be set prior to selecting other BITS IN Configuration options.	**E1** T1 2048 kHz
Line Code	Sets the BITS line code. If Line Type is set to E1, then the options available are E1 HDB3 and E1 AMI. If Line Type is set to T1, then the options available are T1 B8ZS and T1 AMI. If Line Type is set to 2048 kHz, then this option is not applicable.	**E1 HDB3** E1 AMI T1 B8ZS T1 AMI
Frame Format	Sets the BITS Frame Format. If Line Type is set to E1, then the options available are E1 Unframed, E1 CRC4 and E1 DualFrame. If Line Type is set to T1, then the options available are T1 SuperFrame and T1 Extended- SuperFrame. If Line Type is set to 2048 kHz, then this option is not applicable.	E1 Unframed **E1 CRC4** E1 DualFrame T1 SuperFrame T1 Extended-SuperFrame
SA Bit	Select the Signalling Associated (SA) Bit. SA Bit is only applicable if Line Type is set to E1.	None **Bit 4** Bit 5 Bit 6 Bit 7 Bit 8
QL Mode	Set the Quality Level Mode. If Line Type is set to 2048 kHz, then this option is not applicable.	**Disabled** Enabled

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Assumed QL	Assumed QL Specifies the assumed Quality Level (QL) on the interface. Only applicable for Synchronous Ethernet capable ports. If the interface's QL Mode is disabled, the specified Assumed QL value is the Quality Level of the interface. In this case, Assumed QL can not be set to QL-NONE. If the interface's QL Mode is enabled, the specified Assumed QL value overrides the received Quality Level of the interface unless Assumed QL is set to QL-NONE. If the Network Clock Type is SONET (Option2) and QL Mode is disabled, the Assumed QL is automatically set to "QL-STU" and is not editable. If the Network Clock Type is changed from SONET to SDH and QL Mode is Disabled, the "Assumed QL" defaults to "QL-EEC1." For both SDH and SONET options, if QL-Mode = Enabled and the Network Clock Type is changed, the Assumed QL defaults to QL-NONE. Valid entry for SDH Network Clock: QL-NONE, QL-PRC, QL-SSU-A, QL-SSU-B, QL-EEC1. Default is QL-EEC1 (QL Mode = Disabled).	QL-NONE QL-PRC QL-SSU-A QL-SSU-B **QL-EEC1**
	Valid entry for SONET Network Clock: QL-NONE, QL-PRS, QL-STU, QL-ST2, QL-TNC, QL-ST3E, QL-EEC2, QL-SMC, QL-PROV. Default: QL-STU (QL Mode = Disabled)	QL-EEC2 QL-PROV QL-PRS QL-SMC QL-STU QL-ST2 QL-ST3E QL-TNC

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Expected QL	Set the Expected Quality Level. If Line Type is set to 2048 kHz, then this option is not applicable. Valid entry for SDH Network Clock: QL-NONE, QL-PRC, QL-SSU-A, QL-SSU-B, QL-EEC1. Default is QL-NONE.	**QL-NONE** QL-PRC QL-SSU-A QL-SSU-B QL-EEC1
	Valid entry for SONET Network Clock: QL-NONE, QL-PRS, QL-STU, QL-ST2, QL-TNC, QL-ST3E, QL-EEC2, QL-SMC, QL-PROV. Default: QL-NONE.	QL-EEC2 QL-PROV QL-PRS QL-SMC QL-STU QL-ST2 QL-ST3E QL-TNC
BITS-OUT (Edit Configuration)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the SYNC administrative state. See “Entity State Descriptions” on p. 430. BITS will not show up as a potential synchronization reference if the administration state is set to Unassigned.	**Unassigned** IS Management
Line Type	Sets the BITS line type. If a 2048kHz or E1 is the desired BITS Line Type, then Network Clock Type should be set to “Option 1". If a T1 is the desired BITS Line Type, then Network Clock Type should be set to “Option 2". AIS or LOF will be detected at the BITS interface endpoints if mismatches of the FSP 150SP's Network Clock Type and the FSP 150SP's line-type are provisioned. Line Type should be set prior to selecting other BITS OUT Configuration options.	**E1** T1 2048 kHz
Line Code	Sets the BITS line code. If Line Type is set to E1, then the options available are E1 HDB3 and E1 AMI. If Line Type is set to T1, then the options available are T1 B8ZS and T1 AMI. If Line Type is set to 2048 kHz, then this option is not applicable.	**E1 HDB3** E1 AMI T1 B8ZS T1 AMI
Frame Format	Sets the BITS Frame Format. If Line Type is set to E1, then the options available are E1 Unframed, E1 CRC4 and E1 DualFrame. If Line Type is set to T1, then the options available are T1 SuperFrame and T1 Extended- SuperFrame. If Line Type is set to 2048 kHz, then this option is not applicable.	E1 Unframed **E1 CRC4** E1 DualFrame T1 SuperFrame T1 Extended-SuperFrame

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
SA Bit	Select the Signalling Associated (SA) Bit. SA Bit is only applicable if Line Type is set to E1.	None
		Bit 4
		Bit 5
		Bit 6
		Bit 7
		Bit 8
QL Mode	Set the Quality Level Mode. If Line Type is set to 2048 kHz, then this option is not applicable.	**Disabled**
		Enabled
Squelch QL	Set the Squelch Quality Level. The Squelch QL attribute is used to define the minimum QL that the system timing can accept. If the system timing QL drops below this selected value, the BITS-OUT is turned off (i.e., no BITS-OUT signal is provided).	**QL-NONE**
		QL-PRC
		QL-SSU-A
		QL-SSU-B
		QL-EEC1
		QL-DNU
Line Build Out	Option to set impedance for cable length or dB. Only applicable if Line Type is “T1”	**0-133 Ft**
		133-266 Ft
		266-399 Ft
		339-533 Ft
		533-655 Ft
		7.5 dB
		15 dB
		22.5 dB
CLK-1-1-1-1, CLK-1-1-1-2, PPS-1-1-1-1 and PPS-1-1-1-2 (Edit Configuration)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the administrative state. See “Entity State Descriptions” on p. 430. The entity does not show up as a potential synchronization reference if the administration state is set to Unassigned.	**Unassigned**
		IS
		Management
Signal Direction (CLK-1-1-1-2 and PPS-1-1-1-2)	Defines the signal direction for this interface. Options are Input or Output, selected from a drop-down list. CLK-1-1-1-1 and PPS-1-1-1-1 are input only and Signal Direction is grayed out.	**Input**
		Output

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Squelch Control	A hierarchy to be established for Squelch control of the CLK and PPS timing interfaces when configured as Outputs. The hierarchy is as follows: • NEVER, where the output is never squelched • HOLDOVER, where output is squelched only in freerun state • LOCK, where output is squelched in holdover and freerun states • Squelch QL, where output is squelched only based on Squelch QL This setting is not applicable for CLK-1-1-1-1 and PPS-1-1-1-1 which are input only, or when CLK-1-1-1-2 and/or PPS-1-1-1-2 is configured as input.	**Never** Holdover Lock Squelch QL
Squelch QL	Set the Squelch Quality Level. The Squelch QL attribute is used to define the minimum QL that the system timing can accept. If the system timing QL drops below this selected value, the interface is turned off (i.e., no output signal is provided). Squelch QL does not apply for interfaces configured as input or when the Squelch Control is set to “Never”.	**QL-NONE** QL-PRC QL-SSU-A QL-SSU-B QL-EEC1 QL-DNU
Assumed QL	Set the Assumed Quality Level. When the CLK or PPS interface is configured as “Input”, an assumed QL level is selected from the drop-down list.	**QL-PRC** QL-SSU-A QL-SSU-B QL-EEC1
TOD-1-1-1-1 (Edit Configuration)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the administrative state. See “Entity State Descriptions” on p. 430.	**Unassigned** IS
Squelch Control	A hierarchy to be established for Squelch control of TOD timing interface. The hierarchy is as follows: • NEVER, where the output is never squelched • HOLDOVER, where output is squelched only in freerun state • LOCK, where output is squelched in holdover and freerun states	**Never** Holdover Lock
GPS-1-1-1-1 (Edit Configuration)		
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Administrative State	Defines the administrative state. See "Entity State Descriptions" on p. 430.	**Unassigned**
		IS
GPS Generation Condition	Defines the antenna configuration for the GPS signal, whether it is monitoring 1 satellite or 3. Selection is made from a drop-down list.	**1SAT**
		3SATS
Antenna Cable Length	Defines the length of the cable connecting the antenna to the GPS interface. Length is set in meters. Range is from 0 to 100. 4.5 nsec/meter is assumed in cable delay calculation.	**0** (0-100)
Communications		
Static Route (Add Static Route) (see **Note**)		
Dest IP Address	Defines the IP address of the destination. The valid values are the IPv4 addresses. The IP address of 0.0.0.0 is reserved for default routes. You can only enter the static default route of 0.0.0.0 if the system default router is 0.0.0.0.	**0.0.0.0**
Subnet Mask	Defines the subnet mask for the destination. The valid values are IPv4 mask. If you set the IP address to 0.0.0.0, the only available choice for subnet mask is 0.0.0.0.	**0.0.0.0**
Gateway IP Address	Defines the IP address of the next hop for remote destinations. For the routes reachable directly from the specified interface, this value should be 0.0.0.0.	**0.0.0.0**
Interface Name	Defines the interface to create a static route.	**eth0**
		Configured Management Tunnel entries
Metric	Metric of the route.	**0** to 65,535
Advertise Route	Defines whether the static route is to be advertised or not. When selected, the static route is advertised on every other interface that has RIP enabled.	Enabled
		Disabled
***Note**: To view Static Routes, select the Static Routes tab. To delete an existing Static Route, enter a right click on the Communication entity in the Selection Tree and select Delete Static Route, then select the desired static route to delete, then select OK.*		
Static ARP Entry (Add Static ARP Entry) (see **Note**)		
IP Address	IP Address to be added to the Address Resolution Protocol entry.	**0.0.0.0**
MAC Address	Media Access Control Address to be added to the ARP entry. MAC addresses are hard-coded at the factory.	**00:00:00:00:00:00** hh:hh:hh:hh:hh:hh
Interface Name	Defines the interface to create the ARP entry.	**eth0**
		Configured Management Tunnel entries

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Note: To view Static ARP Entries, select the Static ARP Entries tab. To delete an existing Static ARP Entry, enter a right click on the Communication entity in the Selection Tree and select Delete Static ARP Entry, then select the desired static ARP entry to delete, then select OK.		
Source Address Config (Edit Source Address Config)		
Address Type	Specifies whether the System IP Address or the Outgoing IP Interface's Address should be used in outgoing IP PDUs.	**Outgoing Interface IP** System IP Address
Source Address Interface Name	Specifies the IP interface name when Address Type is set to "System IP Address." The IP Address associated with the IP interface name is set as the source IP Address in outgoing PDUs.	**eth0** Configured Management Tunnel entries
Snmp v1 Interface Name	Specifies the IP interface name, which will be used in the SNMPv1 TRAP PDUs as the Agent's IP Address.	**eth0** Configured Management Tunnel entries
DCN (eth0) (Edit Configuration)		
IP Address	IP Address for the Data Communications Network. This option is not applicable if DHCP is set to Enabled and DHCP Role is set to DHCP Client.	**192.168.0.2**
Netmask	Defines the subnet mask for the Data Communications Network. This option is not applicable if DHCP is set to Enabled and DHCP Role is set to DHCP Client. If DHCP is Enabled and DHCP Role is set to DHCP Server, the Netmask determines the number of IP addresses available for assignment.	**255.255.255.0**
RIPv2	Allows setting/disabling of Routing Information Protocol V2 packets.	Enabled **Disabled**
DHCP	Defines whether Dynamic Host Configuration Protocol is enabled or disabled. If this interface is set to Enabled and DHCP Role is set to DHCP Client, the SP-100 sends a broadcast query requesting IP address information from a DHCP server.	Enabled **Disabled**
DHCP Role	Defines whether Dynamic Host Configuration Protocol Role is as a server or a client. Servers assign IP addresses, Clients receive addresses. This option is only applicable if DHCP is set to Enabled. If the DHCP Role is set to DHCP Server, the user must Disable and then Enable DHCP for the initialization of the server function (IP Address range) to take place.	DHCP Server **DHCP Client**
DHCP Client ID Control	Option to enable inserting a DHCP Client ID in DHCP messages when the DHCP Role is set to 'DHCP Client'.	**Disabled** Enabled

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
DHCP Client ID	Client ID maximum length is 254 characters and the default value is the System Name truncated to 254 characters. Only used if DHCP Role is set to 'DHCP Client' and DHCP Client ID Control is 'Enabled'.	(system name)
Edit System Default Gateway	Selecting the check box allows editing the Gateway IP Address. Only applicable if DHCP is Disabled.	(check box, deselected)
Gateway IP Address	Enter a Gateway IP Address if the "Edit System Default Gateway" check box is selected.	(grayed out)
3G DCN (Select to Display Configuration)		
	The 3G DCN information is viewable, but not editable.	
Create / Edit / Delete Management Tunnels (see the *FSP 150SP-100 Technical Descriptions* document)		
SNMP		
Add / Delete Community (see **Note**)		
Community Name	Entry for the valid Community Name.	**public** **private**
Access Type	Defines the access type.	**Read Only** (public) **Read/Write** (private)
***Note**: To delete an existing Community Name, enter a right click on the SNMP entity in the Selection Tree and select Delete Community. Then select the desired Community Name from the selection list and select OK.*		
Add / Delete Target Address (see **Note**)		
Target Address Name	User defined text/number string used to identify this target address. Entry can be up to 32 characters long.	up to 32 characters **(blank)**
Transport Address	IPv4 address	**0.0.0.0**
Port	Port of the SNMP trap receiver.	**162**
Target Params Name	Selectable list of user defined target parameter names. The associated Target Parameters must first be entered prior to selecting this option. See "Add / Delete Target Parameters (see Note)" on p. 462.	Selectable list of user defined target parameter names **(blank)**
Timeout [1/100s]	Length of time to wait before timeout occurs in 1/100s of a second.	**2**
Retry Count	How many times to retry.	**3**
Tag List	Drop-down list to select the desired type of tag list for this target address.	**info** trap
SNMP Dying Gasp	Whether or not SNMP dying gasp is enabled on the SP-100.	**Enabled** Disabled
***Note**: Up to 10 Target addresses are supported. To delete an existing Target Address, select the SNMP entity in the Selection Tree and the Target Addresses tab. Then enter a right click on the desired Target Address and select Delete Entry.*		

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Add / Delete Target Parameters (see Note)		
Target Parameter Name	User defined text/number string used to identify this set of target parameters. Entry can be up to 32 characters long.	up to 32 characters **(blank)**
Security Model	Drop-down list for selection of a security model for this set of target parameters.	**SNMPv1**
		SNMPv2c
		USM
Security Level	Sets the security level for the new Target Parameter. Only applicable if Security Level USM is selected.	**No Authentication**
		Auth/No Priv
		Auth/Priv
Security Name	Drop down list of available security names for SNMPv1 or SNMPv2c.	**private**
		public
	Drop down list of available security names for USM.	ADMIN
		MONITOR
		OPERATOR
		PROVISION
***Note**: To delete an existing Target Parameter, right click on the SNMP entity in the Selection Tree and select the Delete Target Parameters item. Then enter a right click on the desired Target Address and select Delete Entry.*		
Add / Delete USM User (see Note)		
User Name	Entry for a valid user name. Valid entry contains only 1 to 32 of the following characters are accepted: "a-z A-Z 0-9 ._-".	1 to 32 characters **(blank)**
Engine ID	An SNMP engine's administratively-unique identifier. Valid entry is 5 to 32 characters. In a simple agent, this value is always that agent's own snmpEngineID value of 'local'. The value can also take the value of the snmpEngineID of a remote SNMP engine with which this user can communicate. Objects of this type are for identification, not for addressing, even though it is possible that an address may have been used in the generation of a specific value. The value for this object may not be all zeros or all 'ff'H or the empty (zero length) string.	5 to 32 characters **(blank)**
Security Name	Security Name. Valid entry contains only 1 to 256 of the following characters are accepted: "a-z A-Z 0-9 ._-". Mandatory entry. If no entry is provided, User Name is substituted automatically.	1 to 256 characters **(blank)**
Security Level	Options are No Authentication, Authentication with No Privacy key or Authentication with Privacy key.	**No Authentication**
		Auth/No Priv
		Auth/Priv
User Access Type	Specifies the user access type.	**Read Only**
		Read/Write

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Auth. Protocol	Drop down list of established authentication protocols. This option is only available if the Security Level is other than No Authentication.	**MD5**
		SHA1
Auth. Key	Entry for an Authentication Key. This option is only applicable if Auth/Priv or Auth/No Priv Security Level is selected. A valid entry contains the following: 1. Contains only alphanumeric and special characters '# * %' and must not begin with '#'. 2. Length from 8 to 32 characters. 3. Contains a mix of upper and lower case alpha characters, at least one special character (# * %) and at least one digit. 4. No more than 2 letters or digits can be repeated in consecutive character positions. 5. Does not contain a sequence of 3 consecutive letters/digits in ascending/descending order.	8 to 32 characters **(blank)**
Confirm Auth. Key	Reenter the key entered in the Auth. Key box to confirm the key.	8 to 32 characters **(blank)**
Priv. Protocol	Drop down list of established privacy protocols. This option is only available if the Security Level is Auth/Priv.	**DES**
		AES
Priv. Key	Entry for a Privacy Key.This option is only applicable if Auth/Priv Security Level is selected. If A valid entry contains the following: 1. Contains only alphanumeric and special characters '# * %' and must not begin with '#'. 2. Length from 8 to 32 characters. 3. Contains a mix of upper and lower case alpha characters, at least one special character (# * %) and at least one digit. 4. No more than 2 letters or digits can be repeated in consecutive character positions. 5. Does not contain a sequence of 3 consecutive letters/digits in ascending/descending order.	8 to 32 characters **(blank)**
Confirm Priv. Key	Reenter the key entered in the Priv. Key box to confirm the key	8 to 32 characters **(blank)**
***Note**: To delete an existing USM user, right click on the SNMP entity in the Selection Tree and select Delete USM User Entry. Then in the Details Pane, select the USM User to delete from the selection box and click on OK.*		

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Dying Gasp (Edit Dying Gasp)		
SNMP Dying Gasp	Dropdown list for each configured Target Address to Enable or Disable SNMP Dying Gasp on that Target Address. At System Defaults, no Target Addresses are configured.	(No Target Addresses Exist)
Administration		
Users (Add User, Edit User or Edit Password)		
User Name	User Identifier (log-in name). The new login name for the user account. Must be at least 1 alphanumeric character long and no more than 32 alphanumeric characters. If the password security strength is set to high, the minimum length of a User ID is 6 characters. Spaces are not allowed. The system supports three levels of username and password security, and is dependent on the security policy setting. See "Security Policy (Edit Policy)" on p. 467. The default Superuser user ID is **root**. Only a Superuser may create or delete a user ID. This option is available when selecting Add User or Edit Password.	1 to 32 characters See "Security Policy (Edit Policy)" on p. 467 **(blank)**
Password / Retype Password	User login password. The system supports three levels of password security, and is dependent on the security policy setting. See "Security Policy (Edit Policy)" on p. 467. Only a Superuser may create a password associated with a new User ID. A Superuser may edit any existing password. Any user may edit their own password. This option is available when selecting Add User or Edit Password. The default Superuser password is **ChgMeNOW**.	1 to 32 characters See "Security Policy (Edit Policy)" on p. 467 **(blank)**
Comment	User comment text string (maximum 128 characters in length). Only a Superuser may edit a user comment. This option is available when selecting Add User or Edit User.	up to 128 characters **(blank)**
Privilege	User Security Level. The Superuser assigns security levels for each user. Refer to "User Authorization Privilege Levels" on p. 436 for more details. Only a Superuser may edit a user privilege level. This option is available when selecting Create New User or Edit User. The default root user ID privilege level is Super User.	Superuser Maintenance Provisioning **Retrieve**
Login Timeout (mins)	Login timeout for the user ID (in minutes). Only a Superuser may edit a user login timeout value. This option is available when selecting Add User or Edit User.	0 (no logout timer) to 99 (minutes) **15** (minutes)
CLI Paging	If the response to a CLI command fills more than one screen, the response is divided into multiple pages if this option is enabled.	Enabled **Disabled**

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Remote Authentication (Edit Remote Authentication)		
Authentication Protocol	Sets the Remote Authentication Protocol type.	**NONE** RADIUS TACACS
Authentication Type	Remote authentication type. Options available are: Password Authentication Protocol (PAP) or Challenge- Handshake Authentication Protocol (CHAP).	**PAP** CHAP
TACACS Privilege Control	When Enabled, the system expects the User Privilege level to be returned from the TACACS+ server. When Disabled, the system does not expect User Privilege level information from the TACACS+ server, but uses the privilege level set in the TACACS Default Privilege Level attribute.	Disabled **Enabled**
TACACS Default Privilege	When TACACS Privilege Level Control is Disabled, this value is used as the user's privilege level once authenticated by the TACACS+ server. When TACACS Privilege Level Control is Enabled, this value is automatically configured to “Not Applicable”.	Retrieve Maintenance Provisioning **Superuser** Not Applicable
NAS IP Address	The IP address of the Network Access Security server. This option is only applicable if Authentication Protocol is set to RADIUS.	**0.0.0.0**
Accounting	Enable or Disable the use of an accounting port.	**Disabled** Enabled
Access Order	Set the RADIUS access order. If the Access Order is set to Local First (the default), user login is first authenticated using local user database. If the local authentication fails, then the system will use RADIUS (if so configured) to authenticate with the remote server. If the Access Order is set to Remote First and if the remote authenticate is enabled, the first try is to authenticate using the remote server. If the remote server is reachable but the authentication failed, the system does not authenticated with the local database and declares authentication failure. If the remote authentication is successful, the system declares the authentication successful. If the remote authentication is not enabled or if the remote server is unreachable, then the system uses the local database to authenticate.	**Local** Remote
Remote Authentication Server (1 to 3) Status	Enables Server for operation.	**Disabled** Enabled

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Remote Authentication Server (1 to 3) Priority	Defines the priority of the server in servicing requests. Multiple servers may have the same priority value. Random ordering is chosen for those servers with equal priority values. Server 1 default is **First**, Server 2 default is **Second** and Server 3 default is **Third**.	First Second Third
Remote Authentication Server (1 to 3) IP Address	The IP address of the specified Remote Authentication Server.	**0.0.0.0**
Edit Server Secret	Check box that if selected allows the editing of the Server Secret.	(deselected)
Remote Authentication Server (1 to 3) Server Secret	Defines the shared secret used for authenticating the SP-100 with the Remote Authentication server. Valid entry is a string of up to 128 non-whitespace characters. To make an entry, select the Edit Server Secret check box.	up to 128 characters **(blank)**
Remote Authentication Server (1 to 3) Port	Defines the UDP port to use when communicating with the Remote Authentication server. Default is 1812 if Authentication Protocol is set to RADIUS or None, default is 49 if Authentication Protocol is set to TACACS.	1 to 65535 **1812** (RADIUS) **49** (TACACS)
Remote Authentication Server (1 to 3) Accounting Port	Defines the UDP port to use for accounting when communicating with the Remote Authentication server. Default is 1813 if Authentication Protocol is set to RADIUS or None, default is 49 if Authentication Protocol is set to TACACS. Only editable if Accounting is Enabled.	1 to 65535 **1813** (RADIUS) **49** (TACACS)
Remote Authentication Server (1 to 3) Timeout	Defines the timeout in seconds after which communication with this server fails. This option is only applicable if Authentication Protocol is set to RADIUS.	2 to 10 **2**
Remote Authentication Server (1 to 3) Retries	The maximum number of tries that will be attempted with this server.	0 to 5 **3**

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Security Policy (Edit Policy)		
Security Policy Strength	The system supports the following three levels of security strength for local user passwords. This setting is used for the basis of user name and password entry. **High:** 1 User Name must be 6 to 32 characters in length and no spaces allowed. 2 Password must be 12 to 32 characters in length. 3 Password must contain only alphanumeric and special characters '# * % - _ .' and must not begin with '#'. 4 Password must contain upper and lower case characters, at least 2 special characters and at least 1 digit. 5 Password must not contain more than 2 letters or digits repeated consecutively. 6 Password must not contain a sequence of 3 consecutive alphanumeric characters in ascending or descending order. 7 Password must not be the same as the User Name. 8 Password must not be 'password/passw0rd' in lower, upper or mixed case. **Medium:** 1 User Name must be 1 to 32 characters in length and no spaces allowed. 2 Password must be 8 to 32 characters in length. 3 Password must contain only alphanumeric and special characters '# * % - _ .' and must not begin with '#'. 4 Password must contain upper and lower case characters, at least 1 digit. 5 Password must not contain more than 2 letters or digits repeated consecutively. 6 Password must not contain a sequence of 3 consecutive alphanumeric characters in ascending or descending order. 7 Password must not be the same as the user name. 8 Password must not be 'password/passw0rd' in lower, upper or mixed case. **Low:** 1 User Name must be 1 to 32 characters in length and no spaces allowed. 2 Password must be 1 to 32 characters in length. 3 Password must contain only alphanumeric and special characters '# * % - _ .' and must not begin with '#'.	**High** Medium Low

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Table 40: System Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Key Generation (Regenerate Keys)		
Regenerate SSL Certificate	Radio button to create a new SSL certificate. If selected, then Edit SSL Certificate Data options are applicable. When an SSL Certificate is generated, the HTTP server is restarted and web access is unavailable during this time (approximately 15 seconds).	(unselected)
Regenerate SSH Key	Radio button to create a new SSH certificate. When an SSH Key is generated, all SSH users are logged off.	(unselected)
Country	Edit SSL Certificate Data - Country	**US**
State	Edit SSL Certificate Data - State	**Texas**
Locality	Edit SSL Certificate Data - Locality	**Richardson**
Organization	Edit SSL Certificate Data - Organization	**ADVA Optical Networking**
Organization Unit	Edit SSL Certificate Data - Organization Unit	**Ethernet Access**
Name	Edit SSL Certificate Data - Name	**ADVA**
Email	Edit SSL Certificate Data - Email	**support@advaoptical.com**
Valid Until	Edit SSL Certificate Data - Valid Until	(varies)

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Network Port Configuration Options and Rules

Refer to the following table for Network Port configuration settings. Also see the following associated options and rules in the *FSP 150SP-100 Technical Descriptions* document. Default settings are identified in bold. The following Network Port settings are shown in order, as seen when using the eVision web browser management tool in Configuration mode.

Table 41: Network Port Configuration Settings (Edit Configuration)

Parameter	Description / Applicable Rules	Option Settings / Defaults
E1000-N-1		
Edit Configuration		
Alias	A text and/or number string the user enters to uniquely identify this Network Port. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the Network Port facility administrative state. The administrative state controls the generation of alarms and event reports. When an entity is in the In Service state, it is fully operational. The Administrative State must be set to Maintenance prior to initiating a loopback or an Etherjack Diagnostic. For more information on Administrative States, see "Entity State Descriptions" on p. 430.	**IS** Management Maintenance Unassigned
Media Type	Defines the port media type.	**Fiber** Copper
MTU	Defines the Maximum Transmission Unit size in bytes. Minimum MTU is 1518; Maximum is 9612.	1518-**9612**
Configured Speed (Fiber)	Sets the configured speed for the network interface. The user can select auto speed detect, auto negotiation or manual configuration.	**Auto 1000 Full** 1000 Full 100 Full
Configured Speed (Copper)	Sets the configured speed for the network interface. The user can select auto negotiation or manual configuration.	**Auto** Auto 1000 Full Auto 1000 Full Master Auto 1000 Full Slave Auto 100 Full Auto 10 Full 100 Full 10 Full
MDIX	If Media Type is Copper MDIX can be edited. If Media Type is Fiber, MDIX is not applicable.	**Auto** Crossed Uncrossed
Auto Diagnostic (Copper)	Enables or disables the automatic Cable Diagnostic tests when the cable is removed from the port.	**Enabled** Disabled
Drop Eligibility Indicator	Enables or disables Drop Eligibility.	**Enabled** Disabled

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Table 41: Network Port Configuration Settings (Edit Configuration) (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Port Shaping	Enables or Disables Network Port Shaping. Shaping is useful to limit the burst size of the traffic being offered to the network. Port rate shaping at the Network Port enables over-subscription of client services without exceeding a specified Network Port bandwidth.	Enabled **Disabled**
Port Shaped Speed	Defines the maximum bandwidth on the Network Port (in bps). Applicable when Port Shaping is Enabled. This allows a carrier to force a virtual maximum bandwidth on a Network Port and allows Access Port services (EIR) to compete for bandwidth allocation. Setting can not be lower than the CIR setting for the Access Port.	0 to **1,000,000,000**
Q in Q EtherType	Defines the Stacked Ethertype to be used to interoperate with Q in Q frames with other vendors. Only editable if Q in Q EtherType Override is enabled.	**0** (hex.)
Q in Q EtherType Override	Enables or disables editing the Q in Q EtherType.	Enabled **Disabled**
Edit Sync-E		
Sync-E Mode	Specifies whether the Ethernet Network Port is enabled or disabled for Synchronous Ethernet Mode. Default is Disabled.	**Disabled** Enabled
QL Mode	Specifies whether the Ethernet Network Port is enabled or disabled for Quality Level (QL) Mode. This option is only applicable for Synchronous Ethernet capable ports, when this option is set to Enabled. When enabled, on receive side: -port shall PEER the Synchronization Status Messages (SSM) slow protocol PDUs and take appropriate action When enabled, on transmit side: -port shall periodically (once a second) transmit QL TLV information PDUs When disabled, on receive side: -port shall terminate and discard any SSM slow protocol PDUs When disabled, on transmit side: -port shall not transmit any SSM slow protocol PDUs	**Disabled** Enabled

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Table 41: Network Port Configuration Settings (Edit Configuration) (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Assumed QL	Assumed QL Specifies the assumed Quality Level (QL) on the interface. Only applicable for Synchronous Ethernet capable ports. If the interface's QL Mode is disabled, the specified Assumed QL value is the Quality Level of the interface. In this case, Assumed QL can not be set to QL-NONE. If the interface's QL Mode is enabled, the specified Assumed QL value overrides the received Quality Level of the interface unless Assumed QL is set to QL-NONE. If the Network Clock Type is SONET (Option2) and QL Mode is disabled, the Assumed QL is automatically set to "QL-STU" and is not editable. If the Network Clock Type is changed from SONET to SDH and QL Mode is Disabled, the "Assumed QL" defaults to "QL-EEC1." For both SDH and SONET options, if QL-Mode = Enabled and the Network Clock Type is changed, the Assumed QL defaults to QL-NONE. Valid entry for SDH Network Clock: QL-NONE, QL-PRC, QL-SSU-A, QL-SSU-B, QL-EEC1. Default is QL-EEC1 (QL Mode = Disabled).	QL-NONE QL-PRC QL-SSU-A QL-SSU-B **QL-EEC1**
	Valid entry for SONET Network Clock: QL-NONE, QL-PRS, QL-STU, QL-ST2, QL-TNC, QL-ST3E, QL-EEC2, QL-SMC, QL-PROV. Default: QL-STU (QL Mode = Disabled)	QL-EEC2 QL-PROV QL-PRS QL-SMC QL-STU QL-ST2 QL-ST3E QL-TNC

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Table 41: Network Port Configuration Settings (Edit Configuration) (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Expected QL	Specifies the expected Quality Level (QL) when the Ethernet Network Port is enabled for QL Mode. This object is only applicable for Synchronous Ethernet capable ports, when QL Mode is Enabled. This option allows the user to set a minimum expected received Quality Level on the port. The valid values depend upon the SYNC entity's Network Clock Type. A value of None represents that a minimum Quality Level is not expected. Choices available depend on the Network Clock Type setting - "option1 - SDH" or "option2 - SONET." The default value is QL-NONE. If the Network Clock Type is changed, Expected QL defaults to "QL-NONE" regardless of previous setting. Valid entry for SDH Network Clock: QL-PRC, QL-SSU-A, QL-SSU-B, QL-EEC1, QL-NONE. Default is QL-NONE.	**QL-NONE** QL-PRC QL-SSU-A QL-SSU-B QL-EEC1
	Valid entry for SONET Network Clock: QL-PRS, QL-STU, QL-ST2, QL-TNC, QL-ST3E, QL-EEC2, QL-SMC, QL-PROV, QL-NONE. Default is QL-NONE.	QL-PRS QL-STU QL-ST2 QL-TNC QL-ST3E QL-EEC2 QL-SMC QL-PROV
Edit A2N Shapers		
Buffer Size	The buffer size in KB of the shaper. Each of the 8 shapers can be set independently.	0-15360 **128** for E1000-N-1 N/A for E1000-N-2

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Access Port Configuration Options and Rules

The following Access Port provisioning options and rules are described for each option setting available:

- Access Port 1 may be either Copper or Fiber.

The following option descriptions are provided as a detailed reference for building services. It provides entry range values, dependencies and identifies default data. For general instructions on building services, see "Provision Access Port" on p. 181. For additional technical data, see the *FSP 150SP-100 Technical Descriptions* document. The following Access Port settings are shown in order, as seen when using the eVision web browser management tool in Configuration mode.

To observe the current allocated and available traffic resources, expand the NE-1 entity under the System entity, select the NTESP100 entity and then select the Resources tab.

Edit Access Port Configuration

The only service type supported for an Access Port is Ethernet Virtual Private Line (EVPL). Refer to the following for Access Port service configuration options and rules.

Ethernet Virtual Private Line (EVPL) Service Provisioning

Refer to the following for provisioning a port in Ethernet Virtual Private Line (EVPL) Mode. It is recommended that you review the following configuration options and rules and pre-determine the desired provisioning details prior to making any provisioning changes to a service. (Default settings are identified in bold.)

Table 42: Configuration Settings for Ethernet Private Line Service

Parameter	Description / Applicable Rules	Option Settings / Defaults
E1000-A-1		
Access Port (Edit Configuration)		
Alias	A text and/or number string the user enters to uniquely identify this Access Port. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Defines the Access Port facility administrative state. The administrative state controls the generation of alarms and event reports. When an entity is in the In Service state, it is fully operational. The Administrative State must be set to Maintenance prior to initiating a loopback or an Etherjack Diagnostic. The Administrative State must first be set to Unassigned state prior to changing the Service Type. For more information on Administrative States, see "Entity State Descriptions" on p. 430.	IS Management Maintenance Disabled **Unassigned**

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Table 42: Configuration Settings for Ethernet Private Line Service (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Media Type	Defines the port media type. It can be Fiber or Copper.	Fiber
		Copper
MTU	Defines the Maximum Transmission Unit size. Minimum MTU is 1518; Maximum is 9600.	1518-**9600**
MDIX (copper or copper SFP)	Defines the Media Dependent Interface, Crossover function for copper interfaces. MDIX allows the interface to change cable signal assignments to compensate for using the incorrect cable type.	**Auto**
		Crossed
		Uncrossed
Configured Speed (Copper)	Sets the configured speed for the access interface. The user can select auto negotiation or manual configuration. If the port is an Access Port configured as a Sync-E Reference, then it must be configured as “Auto 1000 Full Slave”.	**Auto**
		Auto 1000 Full
		Auto 1000 Full Master
		Auto 1000 Full Slave
		Auto 100 Full
		Auto 10 Full
		100 Full
		10 Full
Configured Speed Access Port (Fiber)	Sets the configured speed for the access interface. The user can select auto negotiation or manual configuration.	**Auto 1000 Full**
		1000 Full
		100 Full
Auto Diagnostic (copper)	Enables or disables the automatic Cable Diagnostic tests when the cable is removed from the port.	**Enabled**
		Disabled
Drop Eligibility Indicator	Enables or disables Drop Eligibility.	**Enabled**
		Disabled
Service Type	Defines the service type for this Access port - Service type is Ethernet Virtual Private Line (EVPL).	**EVPL**
AFP	Defines the Acceptable Frame Policy. See the *FSP 150SP-100 Technical Descriptions* document.	AFP Tagged
		AFP Untagged
		AFP All
Q in Q Ethertype	Defines the Stacked Ethertype to be used to inter-operate with Queue-in-Queue frames with other vendors. Only editable if Q in Q EtherType Override is enabled.	**0** (hex)
Q in Q EtherType Override	Enables or disables editing the Q in Q EtherType.	Enabled
		Disabled
Port Shaping	Enables or Disables Access Port Shaping. Port shaping limits the output traffic rate to a value below the provisioned/negotiated physical port speed. Shaping is useful to limit the burst size of the traffic being offered to the client.	**Enabled**
		Disabled
Port Shaped Speed	Defines the maximum bandwidth on the Access Port (in bps). Applicable when Port Shaping is Enabled.	0 to 1,000,000,000 (bps)

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Table 42: Configuration Settings for Ethernet Private Line Service (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Edit Sync-E		
Sync-E Mode	Specifies whether the Ethernet Network Port is enabled or disabled for Synchronous Ethernet Mode. Default is Disabled.	**Disabled** Enabled
QL Mode	Specifies whether the Ethernet Network Port is enabled or disabled for Quality Level (QL) Mode. This option is only applicable for Synchronous Ethernet capable ports, when this option is set to Enabled. When enabled, on receive side: -port shall PEER the Synchronization Status Messages (SSM) slow protocol PDUs and take appropriate action When enabled, on transmit side: -port shall periodically (once a second) transmit QL TLV information PDUs When disabled, on receive side: -port shall terminate and discard any SSM slow protocol PDUs When disabled, on transmit side: -port shall not transmit any SSM slow protocol PDUs	**Disabled** Enabled

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Table 42: Configuration Settings for Ethernet Private Line Service (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Assumed QL	Assumed QL Specifies the assumed Quality Level (QL) on the interface. Only applicable for Synchronous Ethernet capable ports. If the interface's QL Mode is disabled, the specified Assumed QL value is the Quality Level of the interface. In this case, Assumed QL can not be set to QL-NONE. If the interface's QL Mode is enabled, the specified Assumed QL value overrides the received Quality Level of the interface unless Assumed QL is set to QL-NONE. If the Network Clock Type is SONET (Option2) and QL Mode is disabled, the Assumed QL is automatically set to "QL-STU" and is not editable. If the Network Clock Type is changed from SONET to SDH and QL Mode is Disabled, the "Assumed QL" defaults to "QL-EEC1." For both SDH and SONET options, if QL-Mode = Enabled and the Network Clock Type is changed, the Assumed QL defaults to QL-NONE. Valid entry for SDH Network Clock: QL-NONE, QL-PRC, QL-SSU-A, QL-SSU-B, QL-EEC1. Default is QL-EEC1 (QL Mode = Disabled).	QL-NONE QL-PRC QL-SSU-A QL-SSU-B **QL-EEC1**
	Valid entry for SONET Network Clock: QL-NONE, QL-PRS, QL-STU, QL-ST2, QL-TNC, QL-ST3E, QL-EEC2, QL-SMC, QL-PROV. Default: QL-STU (QL Mode = Disabled)	QL-EEC2 QL-PROV QL-PRS QL-SMC QL-STU QL-ST2 QL-ST3E QL-TNC

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Table 42: Configuration Settings for Ethernet Private Line Service (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Expected QL	Specifies the expected Quality Level (QL) when the Ethernet Network Port is enabled for QL Mode. This object is only applicable for Synchronous Ethernet capable ports, when QL Mode is Enabled. This option allows the user to set a minimum expected received Quality Level on the port. The valid values depend upon the SYNC entity's Network Clock Type. A value of None represents that a minimum Quality Level is not expected. Choices available depend on the Network Clock Type setting - "option1 - SDH" or "option2 - SONET." The default value is QL-NONE. If the Network Clock Type is changed, Expected QL defaults to "QL-NONE" regardless of previous setting. Valid entry for SDH Network Clock: QL-PRC, QL-SSU-A, QL-SSU-B, QL-EEC1, QL-NONE. Default is QL-NONE.	**QL-NONE** QL-PRC QL-SSU-A QL-SSU-B QL-EEC1
	Valid entry for SONET Network Clock: QL-PRS, QL-STU, QL-ST2, QL-TNC, QL-ST3E, QL-EEC2, QL-SMC, QL-PROV, QL-NONE. Default is QL-NONE.	QL-PRS QL-STU QL-ST2 QL-TNC QL-ST3E QL-EEC2 QL-SMC QL-PROV

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Performance Monitoring Settings

Refer to the following tables for Performance Monitoring (PM) Threshold Crossing Alert (TCA) monitored types and associated default settings for Network Port, Access Port, Flows, Shapers, QOS, Policer, ESA and RADIUS:

- “Ethernet Network Port Monitored Types” on p. 478
- “Ethernet Access Port Monitored Types” on p. 483
- “Precision Time Protocol Flow Monitored Types” on p. 488

For RADIUS, PM counters may be displayed and registers may be initialized.

Note

RADIUS PM counts are only applicable where Remote Authentication Protocol is set to RADIUS.

Refer to “Network/Access Port Performance Monitoring” on p. 321 for procedures on viewing, editing and initializing PMs using eVision.

Ethernet Network Port Monitored Types

The following performance parameters are related to an Ethernet Network port.

Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
ABR-RX	Average Bit Rate Received. The average bit rate received over the specific interval in the ingress direction. If there is link down during the interval, the bin is not accessible. This counter is based on RMON etherStatsOctets.	Receive	Near End	0	0
ABR-TX	Average Bit Rate Transmitted. The average bit rate transmitted over a specific interval in the egress direction, based on Bytes Sent. If there is link down during the interval, the bin is not accessible.	Transmit	Near End	0	0
ESBF	EtherStats Broadcast Frames. The Broadcast Frames Sent in the egress direction If there is link down during the interval, the bin is not accessible.	Transmit	Near End	0	0
ESBP	EtherStats Broadcast Packets Received. The total number of good packets received that were directed to the broadcast address. Note that this does not include multicast packets.	Receive	Near End	0	0

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Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
ESBS	EtherStats Bytes Sent. The Bytes Sent in the egress direction. If there is link down during the interval, the bin is not accessible.	Transmit	Near End	0	0
ESC	EtherStats Collisions. The best estimate of the total number of collisions on this Ethernet segment. The value returned will depend on the location of the RMON probe. Section 8.2.1.3 (10BASE-5) and section 10.3.1.3 (10BASE-2) of IEEE standard 802.3 states that a station must detect a collision, in the receive mode, if three or more stations are transmitting simultaneously. A repeater port must detect a collision when two or more stations are transmitting simultaneously.	Receive	Near End	0	0
ESCAE	EtherStats CRC (Cyclic Redundancy Check) Aligned Errors. The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).	Receive	Near End	37055	3557280
ESDE	EtherStats Drop Events. The total number of events in which packets were dropped due to lack of resources. Note that this number is not necessarily the number of packets dropped; it is just the number of times this condition has been detected.	None	Near End	37055	3557280
ESF	EtherStats Fragments. The total number of packets received that were less than 64 octets in length (excluding framing bits but including FCS octets) and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). Note that it is entirely normal for etherStatsFragments to increment. This is because it counts both runts (which are normal occurrences due to collisions) and noise hits.	Receive	Near End	37055	3557280
ESFS	EtherStats Frames Sent. The Frames Sent in the egress direction. If there is link down during the interval, the bin is not accessible.	Transmit	Near End	0	0

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Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
ESJ	EtherStats Jabbers. The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). Note that this definition of jabber is different than the definition in IEEE-802.3 section 8.2.1.5 (10BASE5) and section 10.3.1.4 (10BASE2). These documents define jabber as the condition where any packet exceeds 20 ms. The allowed range to detect jabber is between 20 ms and 150 ms.	Receive	Near End	0	0
ESMF	EtherStats Multicast Frames. The Multicast Frames Sent in the egress direction. If there is link down during the interval, the bin is not accessible.	Transmit	Near End	0	0
ESMP	EtherStats Multicast Packets Received. The total number of good packets received that were directed to a multicast address. Note that this number does not include packets directed to the broadcast address.	Receive	Near End	0	0
ESO	EtherStats Octets Received. The total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESOF	EtherStats Oversize Frames. The total number of frames received that were oversized.	Transmit	Near End	0	0
ESOP	EtherStats Oversize Packets. The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed.	Receive	Near End	37055	3557280
ESP	EtherStats Packets Received. EtherStats Packets Received. The total number of packets (including bad packets, broadcast packets, and multicast packets) received.	Receive	Near End	0	0
ESP64	EtherStats Packets - 0 to 64 Octets Frames. The total number of packets (including bad packets) received that were 64 octets in length (excluding framing bits but including FCS octets).	Receive	Near End	0	0

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Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
ESP65	EtherStats Packets - 65 to 127 Octets Frames. The total number of packets (including bad packets) received that were between 65 and 127 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP128	EtherStats Packets - 128 to 255 Octets Frames. The total number of packets (including bad packets) received that were between 128 and 255 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP256	EtherStats Packets - 256 to 511 Octet Packets. The total number of packets (including bad packets) received that were between 256 and 511 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP512	EtherStats Packets - 512 to 1023 Octets Frames. The total number of packets (including bad packets) received that were between 512 and 1023 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP1024	EtherStats Packets - 1024 to 1518 Octets Frames. The total number of packets (including bad packets) received that were between 1024 and 1518 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP1519	EtherStats Packets - 1519 to 1536 Octets Frames. The total number of packets (including bad packets) received that were between 1519 and 1536 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESUF	EtherStats Unicast Frames. The Unicast Frames Sent in the egress direction. If there is link down during the interval, the bin is not accessible.	Transmit	Near End	0	0
ESUP	EtherStats Undersize Packets. The total number of packets received that were less than 64 octets long (excluding framing bits, but including FCS octets) and were otherwise well formed.	Receive	Near End	37055	3557280

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Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
L2CPFD	Layer 2 Control Protocol Frames Discarded. Number of Layer 2 Control Protocol Frames discarded on the interface.	Receive	Near End	0	0
L2CPFP	Layer 2 Control Protocol Frames Processed. Number of Layer 2 Control Protocol Frames processed on the interface.	Receive	Near End	0	0
LBC	Laser Bias Current retrieved from the SFP.	Receive	Near End	0	0
OPR	Optical Power Receive. Received Optical Power (in dBm) retrieved from the SFP.	Receive	Near End	-80	-80
OPT	Optical Power Transmit. Transmit Optical Power (in dBm) retrieved from the SFP.	Transmit	Near End	-80	-80
OPR-VAR	Optical Power Received - Variance. The variance from the configured OPR threshold that does not result in generating a TCA. For example, if OPR is -80 and OPR-VAR is 4, no TCA is generated if OPR is between -76 and -84. Applicable only if the media type is Fiber.	Receive	Near End	4	4
OPT-VAR	Optical Power Transmit - Variance. The variance from the configured OPT threshold that does not result in generating a TCA. For example, if OPT is -80 and OPR-VAR is 4, no TCA is generated if OPT is between -76 and -84. Applicable only if the media type is Fiber.	Transmit	Near End	4	4
TEMP	Temperature for the physical layer (expressed in Celsius).	None	Near End	0	0
UAS	Unavailable Seconds - counted if one or more of following exists in that second: Link down, link deactivated (triggered by LLF), SFP faults, EFM-OAM discovery failure, and EFM-OAM local loopback. Also, any one of the following port based MEP conditions: cross connect defect (unexpected MD level or MAID Mismatch), Error CCM Defect (Unexpected MEP or unexpected period), RMEP CCM Defect (Loss of Connectivity), and RDI Defect (unidirectional failure makes the port based service unavailable).	Receive	Near End	10	10

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Ethernet Access Port Monitored Types

The following performance parameters are related to an Ethernet Access Port. The optical, physical layer parameters are only valid when the port is configured to use the fiber interfaces.

Table 43: Ethernet Access Port Monitored Types and Default TCA Settings

Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
ABR-RX	Average Bit Rate Received (in the A2N direction). The average bit rate received over the specific interval in the ingress direction. This counter is based on RMON etherStatsOctets.	Receive	Near End	0	0
ABR-TX	Average Bit Rate Transmitted (in the N2A direction). The average bit rate transmitted over a specific interval in the egress direction, based on Bytes Sent.	Transmit	Near End	0	0
APFD	AFP Priority-tagged Frames Dropped. Priority-tagged frames dropped due to AFP setting. AFP Priority-tagged Frames Dropped. Priority-tagged frames dropped due to AFP setting.	Receive	Near End	0	0
AUFD	AFP Untagged Frames Dropped. Untagged frames dropped due to AFP setting.	Receive	Near End	0	0
ESBF	EtherStats Broadcast Frames. If there is link down during the interval, the bin is not accessible.	Receive	Near End	0	0
ESBP	EtherStats Broadcast Packets Received (in the A2N direction). The total number of good packets received that were directed to the broadcast address. Note that this does not include multicast packets.	Receive	Near End	0	0
ESBS	EtherStats Bytes Sent.	Transmit	Near End	0	0
ESC	EtherStats Collisions. The best estimate of the total number of collisions on this Ethernet segment. The value returned will depend on the location of the RMON probe. Section 8.2.1.3 (10BASE-5) and section 10.3.1.3 (10BASE-2) of IEEE standard 802.3 states that a station must detect a collision, in the receive mode, if three or more stations are transmitting simultaneously. A repeater port must detect a collision when two or more stations are transmitting simultaneously.	Receive	Near End	0	0

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Table 43: Ethernet Access Port Monitored Types and Default TCA Settings (Continued)

Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
ESCAE	EtherStats CRC (Cyclic Redundancy Check) Aligned Errors. The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error).	Receive	Near End	37055	3557280
ESDE	EtherStats Drop Events. The total number of events in which packets were dropped due to lack of resources. Note that this number is not necessarily the number of packets dropped; it is just the number of times this condition has been detected.	Receive	Near End	37055	3557280
ESF	EtherStats Fragments. The total number of packets received that were less than 64 octets in length (excluding framing bits but including FCS octets) and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). Note that it is entirely normal for etherStatsFragments to increment. This is because it counts both runts (which are normal occurrences due to collisions) and noise hits.	Receive	Near End	37055	3557280
ESFS	EtherStats Frames Sent. The Frames Sent in the egress direction.	Transmit	Near End	0	0
ESJ	EtherStats Jabbers. The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). Note that this definition of jabber is different than the definition in IEEE-802.3 section 8.2.1.5 (10BASE5) and section 10.3.1.4 (10BASE2). These documents define jabber as the condition where any packet exceeds 20 ms. The allowed range to detect jabber is between 20 ms and 150 ms.	Receive	Near End	0	0

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Table 43: Ethernet Access Port Monitored Types and Default TCA Settings (Continued)

Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
ESMF	EtherStats Multicast Frames. The Multicast Frames Sent in the egress direction.	Transmit	Near End	0	0
ESMP	EtherStats Multicast Packets Received. EtherStats Multicast Packets Received. The total number of good packets received that were directed to a multicast address. Note that this number does not include packets directed to the broadcast address.	Receive	Near End	0	0
ESO	EtherStats Octets Received. The total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESOF	EtherStats Oversize Frames. The total number of frames transmitted that were oversized.	Transmit	Near End	0	0
ESOP	EtherStats Oversize Packets. The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed.	Receive	Near End	37055	3557280
ESP	EtherStats Packets Received. The total number of packets (including bad packets, broadcast packets, and multicast packets) received.	Receive	Near End	0	0
ESP64	EtherStats Packets - 0 to 64 Octets Frames. The total number of packets (including bad packets) received that were 64 octets in length (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP65	EtherStats Packets - 65 to 127 Octets Frames. The total number of packets (including bad packets) received that were between 65 and 127 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP128	EtherStats Packets - 128 to 255 Octets Frames. The total number of packets (including bad packets) received that were between 128 and 255 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0

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Table 43: Ethernet Access Port Monitored Types and Default TCA Settings (Continued)

Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
ESP256	EtherStats Packets - 256 to 511 Octet Packets. The total number of packets (including bad packets) received that were between 256 and 511 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP512	EtherStats Packets - 512 to 1023 Octets Frames. The total number of packets (including bad packets) received that were between 512 and 1023 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP1024	EtherStats Packets - 1024 to 1518 Octets Frames. The total number of packets (including bad packets) received that were between 1024 and 1518 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESP1519	EtherStats Packets - 1519 to 1536 Octets Frames. The total number of packets (including bad packets) received that were between 1519 and 1536 octets in length inclusive (excluding framing bits but including FCS octets).	Receive	Near End	0	0
ESUF	EtherStats Unicast Frames sent. If there is link down during the interval, the bin is not accessible.	Transmit	Near End	0	0
ESUP	EtherStats Undersize Packets received. The total number of packets received that were less than 64 octets long (excluding framing bits, but including FCS octets) and were otherwise well formed.	Receive	Near End	37055	3557280
L2CPFD	Layer 2 Control Protocol Frames Discarded. Number of Layer 2 Control Protocol Frames discarded on the interface.	Receive	Near End	0	0
L2CPFP	Layer 2 Control Protocol Frames Processed. Number of Layer 2 Control Protocol Frames processed on the interface.	Receive	Near End	0	0
LBC[1]	Laser Bias Current retrieved from the SFP. Applicable only if the media type is Fiber.	Receive	Near End	0	0
LES	Line Errored Seconds detected. Increments if a False Carrier or Errored Symbol event occurs since the last 1 second poll.	Receive	Near End	0	0
OPR[1]	Optical Power Receive. Received Optical Power (in dBm) retrieved from the SFP.	Receive	Near End	-80	-80

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Table 43: Ethernet Access Port Monitored Types and Default TCA Settings (Continued)

Monitored Type	Description	Direction	Location	5/15 Min.	1 Day
OPT[1]	Optical Power Transmit. Transmit Optical Power (in dBm) retrieved from the SFP.	Receive	Near End	-80	-80
OPR-VAR[1]	Optical Power Received - Variance. The variance from the configured OPR threshold that does not result in generating a TCA. For example, if OPR is -80 and OPR-VAR is 4, no TCA is generated if OPR is between -76 and -84. Applicable only if the media type is Fiber.	Receive	Near End	4	4
OPT-VAR[1]	Optical Power Transmit - Variance. The variance from the configured OPT threshold that does not result in generating a TCA. For example, if OPT is -80 and OPR-VAR is 4, no TCA is generated if OPT is between -76 and -84. Applicable only if the media type is Fiber.	Transmit	Near End	4	4
TEMP[1]	Temperature for the physical layer (expressed in Celsius).	None	Near End	0	0
UAS[2]	Unavailable Seconds. Used by Network/Service Management Systems to compute port-based service unavailability. Counted if one or more of following exists in that second: • Link down • link deactivated (triggered by LLF) • SFP faults • EFM-OAM discovery failure • EFM-OAM loopback. Also, any one of the following port based MEP conditions: • Port-based cross-connect defect (unexpected MD level or MAID Mismatch/Mismerge) • Port-based MEP Error CCM Defect (Unexpected MEP or unexpected period) • Port-based MEP RMEP CCM Defect (Loss of Connectivity) • Port-based MEP RDI Defect (unidirectional failure makes the port based service unavailable)	Receive	Near End	0	0

1. Valid only when the port is configured to use the fiber interfaces.
2. Any second that is deemed UAS for the port will also be UAS for all the EVCs on that port.

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Precision Time Protocol Flow Monitored Types

The following performance parameters and associated default settings are for each of the thresholds which are supported on PTP Flows. The following PMs are accessed via the Precision Time Protocol application when PTP Flow Points are created.

Table 44: PTP Flow Monitored Types and Default TCA Settings

Monitored Type	Definition	Direction	Location	5/15 Min.	1 Day
ANNOUNCESRX	PTP Announce Messages Received	Receive	Near End	0	0
ANNOUNCESTX	PTP Announce Messages Transmitted	Transmit	Near End	0	0
DELAYREQSRX	PTP Delay_Req Messages Received	Receive	Near End	0	0
DELAYREQSTX	PTP Delay_Req Messages Transmitted	Transmit	Near End	0	0
DELAYRSPSRX	PTP Delay_Resp Messages Received	Receive	Near End	0	0
DELAYRSPSTX	PTP Delay_Resp Messages Transmitted	Transmit	Near End	0	0
FOLLOWUPSRX	PTP Follow_Up Messages Received	Receive	Near End	0	0
FOLLOWUPSTX	PTP Follow_Up Messages Transmitted	Transmit	Near End	0	0
MGMTFRAMESRX	PTP Management Frames Received	Receive	Near End	0	0
MGMTFRAMESTX	PTP Management Frames Transmitted	Transmit	Near End	0	0
PDELAYREQSRX	PTP Pdelay_Req Messages Received	Receive	Near End	0	0
PDELAYREQSTX	PTP Pdelay_Req Messages Transmitted	Transmit	Near End	0	0
PDELAYRSPSRX	PTP Pdelay_Resp Messages Received	Receive	Near End	0	0
PDELAYRSPSTX	PTP Pdelay_Resp Messages Transmitted	Transmit	Near End	0	0
PDELAYRSPFOLUPSRX	PTP Pdelay_Resp_Follow_Up Messages Received	Receive	Near End	0	0
PDELAYRSPFOLUPSTX	PTP Pdelay_Resp_Follow_Up Messages Transmitted	Transmit	Near End	0	0
PTPUNKNOWNSRX	Unknown PTP Messages Received	Receive	Near End	0	0
PTPUNKNOWNSTX	Unknown PTP Messages Transmitted	Transmit	Near End	0	0

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Table 44: PTP Flow Monitored Types and Default TCA Settings (Continued)

Monitored Type	Definition	Direction	Location	5/15 Min.	1 Day
SIGNALINGRX	PTP Signaling Messages Received	Receive	Near End	0	0
SIGNALINGTX	PTP Signaling Messages Transmitted	Transmit	Near End	0	0
SYNCSRX	PTP Sync Messages Received	Receive	Near End	0	0
SYNCSTX	PTP Sync Messages Transmitted	Transmit	Near End	0	0
AVGSYNCRESTIME	Average Residence Time for PTP Sync Messages	Receive	Near End	0	0
MINSYNCRESTIME	Minimum Residence Time for PTP Sync Messages	Receive	Near End	0	0
MAXSYNCRESTIME	Maximum Residence Time for PTP Sync Messages	Receive	Near End	0	0
AVGPDELAYREQRESTIME	Average Residence Time for Peer Delay_Req Messages	Receive	Near End	0	0
MINDELAYREQRESTIME	Minimum Residence Time for PTP Delay_Req Messages	Receive	Near End	0	0
MAXPDELAYREQRESTIME	Maximum Residence Time for Peer Delay_Req Messages	Receive	Near End	0	0
AVGDELAYREQRESTIME	Average Residence Time for PTP Delay_Req Messages	Receive	Near End	0	0
MINPDELAYREQRESTIME	Minimum Residence Time for Peer Delay_Req Messages	Receive	Near End	0	0
MAXDELAYREQRESTIME	Maximum Residence Time for PTP Delay_Req Messages	Receive	Near End	0	0
AVGPDELAYRSPRESTIME	Average Residence Time for Peer Delay_Rsp Messages	Receive	Near End	0	0
MINPDELAYRSPRESTIME	Minimum Residence Time for Peer Delay_Rsp Messages	Receive	Near End	0	0
MAXPDELAYRSPRESTIME	Maximum Residence Time for Peer Delay_Rsp Messages	Receive	Near End	0	0

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Slave Only Ordinary Clock Monitored Types

The following performance parameters and associated default settings are for each of the thresholds which are supported on a Slave Only Ordinary Clock. The following PMs are accessed via the Precision Time Protocol application when PTP software licensing is enabled and a Telecom Slave is created.

Table 45: SOOC Monitored Types and Default TCA Settings

Monitored Type	Definition	Direction	Location	5/15 Min.	1 Day
PTPMGMTMSGSD	PTP Management Message Discards	Receive	Near End	0	0
PTPINVMSGLEND	PTP Invalid Message Length Discards	Receive	Near End	0	0
PTPUNKMASTERD	PTP Unknown Master Discards	Receive	Near End	0	0
PTPUNKDOMAIND	PTP Unknown Domain Discards	Receive	Near End	0	0
PTPMULTIANNOUNCED	PTP Multicast Announce Message Discards	Receive	Near End	0	0
PTPOOSANNOUNCES	PTP Out Of Sequence Announce Messages	Receive	Near End	0	0
PTPMULTISYNCD	PTP Multicast Sync Message Discards	Receive	Near End	0	0
PTPTWOSTEPSYNCD	PTP Two Step Sync Message Discards	Receive	Near End	0	0
PTPFOLLOWUPSD	PTP Follow-up Message Discards	Receive	Near End	0	0
PTPDELAYREQSD	PTP Delay_Req Message Discards	Receive	Near End	0	0
PTPPDELAYREQSD	PTP PDelay_Req Message Discards	Receive	Near End	0	0
PTPPDELAYRSPSD	PTP PDelay_Resp Message Discards	Receive	Near End	0	0
PTPPDELAYFOLLOWUPSD	PTP PDelay Follow-up Message Discards	Receive	Near End	0	0
PTPINVTLVLENSD	PTP Invalid TLV Length Discards	Transmit	Near End	0	0
PTPINVTLVTYPESD	PTP Invalid TLV Type Discards	Receive	Near End	0	0
AVGSYNCPD	Average Sync Path Delay (nsec)	Receive	Near End	0	0
MINSYNCPD	Minimum Sync Path Delay (nsec)	Receive	Near End	0	0
MAXSYNCPD	Maximum Sync Path Delay (nsec)	Receive	Near End	0	0
AVGSYNCPDV	Average Sync PDV (nsec)	Receive	Near End	0	0

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Table 45: SOOC Monitored Types and Default TCA Settings (Continued)

Monitored Type	Definition	Direction	Location	5/15 Min.	1 Day
MINSYNCPDV	Minimum Sync PDV (nsec)	Receive	Near End	0	0
MAXSYNCPDV	Maximum Sync PDV (nsec)	Receive	Near End	0	0
AVGMEANPATHDELAY	Average Mean Path Delay (nsec)	Receive	Near End	0	0
MINMEANPATHDELAY	Minimum Mean Path Delay (nsec)	Receive	Near End	0	0
MAXMEANPATHDELAY	Maximum Mean Path Delay (nsec)	Receive	Near End	0	0
AVGOFM	Average Offset from Master (nsec)	Receive	Near End	0	0
MINOFM	Minimum Offset from Master (nsec)	Receive	Near End	0	0
MAXOFM	Maximum Offset from Master (nsec)	Receive	Near End	0	0

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Telecom Slave Clock Analysis Monitored Types

The following performance parameters and associated default settings are for each of the thresholds which are supported on a Slave Only Ordinary Clock under Clock Analysis in SyncJack. The following PMs are accessed via the SyncJack application when PTP software licensing is enabled and a Telecom Slave is created.

Table 46: SOOC Monitored Types and Default TCA Settings

Monitored Type	Definition	Direction	Location	5/15 Min.	1 Day
TOTALTIMECR5	Total time clock recovery score = 5	Receive	Near End	0	0
TOTALTIMECR4	Total time clock recovery score = 4	Receive	Near End	0	0
TOTALTIMECR3	Total time clock recovery score = 3	Receive	Near End	0	0
TOTALTIMEPR5	Total time pulse recovery score = 5	Receive	Near End	0	0
TOTALTIMEPR4	Total time pulse recovery score = 4	Receive	Near End	0	0
TOTALTIMEPR3	Total time pulse recovery score = 3	Receive	Near End	0	0

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PTP Network Probe Monitored Types

The following performance parameters and associated default settings are for each of the thresholds which are supported on a PTP Network Probe. The following PMs are accessed via the SyncJack application when PTP software licensing is enabled and a PTP Network Probe is created.

Table 47: SOOC Monitored Types and Default TCA Settings

Monitored Type	Definition	Direction	Location	5/15 Min.	1 Day
AVGMEANPATHDELAY	Average Mean Path Delay	Receive	Near End	0	0
MINMEANPATHDELAY	Minimum Mean Path Delay	Receive	Near End	0	0
MAXMEANPATHDELAY	Maximum Mean Path Delay	Receive	Near End	0	0
AVGSYNCPDV	Average Path Delay From Master To Slave	Receive	Near End	0	0
MINSYNCPDV	Minimum Path Delay From Master To Slave	Receive	Near End	0	0
MAXSYNCPDV	Maximum Path Delay From Master To Slave	Receive	Near End	0	0
MINRPDVFWD	Minimum Residual Packet Delay Variation Forward Direction	Receive	Near End	0	0
AVGRESPDVFWD	Average Residual Packet Delay Variation Forward Direction	Receive	Near End	0	0
RESPDVFWDLOW	Total Number Of Forward Residual Packet Delay Variation Results In Low Range	Receive	Near End	0	0
RESPDVFWDMEDIUM	Total Number Of Forward Residual Packet Delay Variation Results In Medium Range	Receive	Near End	0	0
RESPDVFWDHIGH	Total Number Of Forward Residual Packet Delay Variation Results In High Range	Receive	Near End	0	0
RESPDVFWDTOTAL	Total Number Of Valid RPDV-frw Results	Receive	Near End	0	0
MINRPDVREV	Minimum Residual Packet Delay Variation Reverse Direction	Receive	Near End	0	0
AVGRESPDVREV	Average Residual Packet Delay Variation Reverse Direction	Transmit	Near End	0	0
RESPDVREVLOW	Total Number Of Reverse Residual Packet Delay Variation Results In Low Range	Receive	Near End	0	0

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Table 47: SOOC Monitored Types and Default TCA Settings (Continued)

Monitored Type	Definition	Direction	Location	5/15 Min.	1 Day
RESPDVREVMEDIUM	Total Number Of Reverse Residual Packet Delay Variation Results In Medium Range	Receive	Near End	0	0
RESPDVREVHIGH	Total Number Of Reverse Residual Packet Delay Variation Results In High Range	Receive	Near End	0	0
RESPDVREVTOTAL	Total Number Of Valid RPD-Vrev Results	Receive	Near End	0	0
FWDSCORE5	Total Time Forward Score=5	Receive	Near End	0	0
FWDSCORE4	Total Time Forward Score=4	Receive	Near End	0	0
FWDSCORE3	Total Time Forward Score=3	Receive	Near End	0	0
REVSCORE5	Total Time Reverse Score=5	Receive	Near End	0	0
REVSCORE4	Total Time Reverse Score=4	Receive	Near End	0	0
REVSCORE3	Total Time Reverse Score=3	Receive	Near End	0	0
SYNCSRX	Number of Received Sync Messages	Receive	Near End	0	0
LOSTSYNCMSGS	Number of Lost Sync Messages	Receive	Near End	0	0
DELAYRSPSRX	Number of Received Delay Response Messages	Receive	Near End	0	0
LOSTDELAYRSPMSGS	Number of Lost Delay Response Messages	Receive	Near End	0	0

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PTP Configuration Options and Rules

The following section describes Precision Time Protocol (PTP) option settings. The options described in this section are performed using the PTP application (located on the Tool Bar or selectable via the Application menu) once the license of this feature has been turned on. The PTP License may be enabled by selecting the Maintenance application, expanding the Administration and Software Licensing entities, entering a right click on Feature Management and selecting Edit Feature.

In addition to configuring PTP options, alarm attributes are editable when the PTP application is selected (see "Precision Time Protocol (PTP) Alarms" on p. 413).

Telecom Slave Provisioning Order

PTP configuration options are created in the following order for Telecom Slave:

- Enable Software Licensing for PTP
- Create a flow on the Associated Port (must be In Service)
- Create / Edit a Telecom Slave:
  - Create / Edit a Slave Only Ordinary Clock (SOOC)
  - Create / Edit a PTP Flow Point (PTPFP)
  - Create / Edit an Ordinary Clock Slave (OCS) Port
- Edit an Ethernet Port's Delay Asymmetry setting

The TS, once provisioned and Locked (the OCS Port State changes to Slave state), may be:

- added as a Sync Reference to the System Sync Domain (SYNC-1-1-1-1)
- selected as a timing source for Boundary Clock and/or Time Clock.
- selected as an output reference for the PPS (PPS-1-1-1-1), or Time of Day (TOD-1-1-1-1) output ports.
- selected as the Source TOD Clock of System Time of Day (ToD)

Boundary Clock Provisioning Order

A Boundary Clock and Master Clock cannot co-exist. Only one or the other may be provisioned and In Service at a time.

PTP configuration options are created in the following order for Boundary Clock:

- Enable Software Licensing for PTP-MC/BC
- Create a flow on the Associated Port (must be In Service)
- Create / Edit a Telecom Slave
- Create / Edit a Boundary Clock
- Create / Edit a Master Clock Interface
- Create / Edit a PTP Flow Point (PTPFP)
- Create / Edit a Master Virtual Port
- Create / Edit a Static Slave or Edit / Delete a Dynamic Slave

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Master Clock Provisioning Order

A Boundary Clock and Master Clock cannot co-exist. Only one or the other may be provisioned and In Service at a time.

PTP configuration options are created in the following order for Master Clock:

- Enable Software Licensing for PTP-MC/BC
- Create a flow on the Associated Port (must be In Service)
- Edit the Time Clock (see Synchronization)
- Add a Time Clock Reference (see Synchronization)
- Create / Edit a Master Clock
- Create / Edit a Master Clock Interface
- Create / Edit a PTP Flow Point (PTPFP)
- Create / Edit a Master Virtual Port
- Create / Edit a Static Slave or Edit / Delete a Dynamic Slave

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Create / Edit a Telecom Slave

A Telecom Slave may be created by selecting the PTP icon on the Tool Bar or selecting PTP from the Applications menu, expanding the system folder in the Selection Tree, entering a right click on the NE-1 entity and selecting Create Telecom Slave. To edit a Telecom Slave, enter a right click on the Telecom Slave entity (TS-1-1) and select Edit.

To delete a Telecom Slave, enter a right click on the Telecom Slave entity and select Delete.

Table 48: Create/Edit Telecom Slave Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Clock Identity (Create only)	Clock Identity of the Telecom Slave. Entry is 16 HEX characters.	(varies)
Administrative State	Enables or disables the Telecom Slave. See "Entity State Descriptions" on p. 430.	IS **Management**
PTP Domain Number (Create only)	This PTP domain number is used in the domain Number field of the PTP header in the PTP packet. This PTP domain number is used when PTP packet is generated by the SOOC.	**0**-127
Time Holdover Accuracy (Create only)	Selects the time holdover accuracy in nanoseconds for the telecom slave. The Holdover state is entered when Telecom Slave is currently locked to the Master Clock and when the active SOOC's OC-S PTP Virtual Port goes to LISTENING or UNCALIBRATED. In this state the phase lock can be sustained for certain amount of time specified as Holdover time before the accuracy becomes insufficient for holdover accuracy requirement. The provisioned value and the assembled oscillator stability co-determine the Holdover time.	500 1000 1500 **5000** 10000
Clock Recovery Mode (Create only)	Selects one way or two way clock recovery mode. • One way: delay request/response messages are not used and in this mode only frequency can be recovered (only sync message) • Two way (default): delay request/response will be used and in this mode frequency and/or phase/time can be recovered	One Way **Two Way**

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Table 48: Create/Edit Telecom Slave Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Sync Reference	Enable or Disable allowing the Telecom Slave to be used as Sync Reference. Default is Disabled. • If set to Enabled, the TS port is available as a possible reference for the system Sync object. • If set to Disabled, the TS port is not available as a possible reference for the system Sync object (SYNC-1-1-1-1). The system Sync object may be used to drive PTP if this option is disabled AND SYNC-1-1-1-1 is selected in the Sync ID option.	**Disabled** Enabled
QL Mode	Specifies whether the Ethernet Network Port is enabled or disabled for Quality Level (QL) Mode. This option is only applicable for Synchronous Ethernet capable ports, when this option is set to Enabled. When enabled, on receive side: -port shall PEER the Synchronization Status Messages (SSM) slow protocol PDUs and take appropriate action When enabled, on transmit side: -port shall periodically (once a second) transmit QL TLV information PDUs When disabled, on receive side: -port shall terminate and discard any SSM slow protocol PDUs When disabled, on transmit side: -port shall not transmit any SSM slow protocol PDUs	Disabled Enabled
Sync ID	Selects an external driver for PTP. If Sync Reference is set to Disabled AND SYNC-1-1-1-1 is selected, then SYNC-1-1-1-1 is used to drive PTP. If Sync Reference is set to Enabled, then only None is applicable. Sync ID is not editable when an SOOC is associated with the TS.	**None** SYNC-1-1-1-1

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Table 48: Create/Edit Telecom Slave Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Assumed QL	Assumed QL Specifies the assumed Quality Level (QL) on the interface. Only applicable for Synchronous Ethernet capable ports. If the interface's QL Mode is disabled, the specified Assumed QL value is the Quality Level of the interface. In this case, Assumed QL can not be set to QL-NONE. If the interface's QL Mode is enabled, the specified Assumed QL value overrides the received Quality Level of the interface unless Assumed QL is set to QL-NONE. If the Network Clock Type is SONET (Option2) and QL Mode is disabled, the Assumed QL is automatically set to "QL-STU" and is not editable. If the Network Clock Type is changed from SONET to SDH and QL Mode is Disabled, the "Assumed QL" defaults to "QL-EEC1." For both SDH and SONET options, if QL-Mode = Enabled and the Network Clock Type is changed, the Assumed QL defaults to QL-NONE. Valid entry for SDH Network Clock: QL-NONE, QL-PRC, QL-SSU-A, QL-SSU-B, QL-EEC1. Default is QL-EEC1 (QL Mode = Disabled).	QL-NONE QL-PRC QL-SSU-A QL-SSU-B **QL-EEC1**
	Valid entry for SONET Network Clock: QL-NONE, QL-PRS, QL-STU, QL-ST2, QL-TNC, QL-ST3E, QL-EEC2, QL-SMC, QL-PROV. Default: QL-STU (QL Mode = Disabled)	QL-EEC2 QL-PROV QL-PRS QL-SMC QL-STU QL-ST2 QL-ST3E QL-TNC

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Table 48: Create/Edit Telecom Slave Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Expected QL	Specifies the expected Quality Level (QL) when the Ethernet Network Port is enabled for QL Mode. This object is only applicable for Synchronous Ethernet capable ports, when QL Mode is Enabled. This option allows the user to set a minimum expected received Quality Level on the port. The valid values depend upon the SYNC entity's Network Clock Type. A value of None represents that a minimum Quality Level is not expected. Choices available depend on the Network Clock Type setting - "option1 - SDH" or "option2 - SONET." The default value is QL-NONE. If the Network Clock Type is changed, Expected QL defaults to "QL-NONE" regardless of previous setting. Valid entry for SDH Network Clock: QL-PRC, QL-SSU-A, QL-SSU-B, QL-EEC1, QL-NONE. Default is QL-NONE.	**QL-NONE** QL-PRC QL-SSU-A QL-SSU-B QL-EEC1

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Create / Edit a Slave Only Ordinary Clock (SOOC)

Once a Telecom Slave has been created, a Slave Only Ordinary Clock (SOOC) may be created by entering a right click on the TS-1-n entity and selecting Create SOOC. To edit an SOOC, enter a right click on the SOOC entity (SOOC-1-1-1-1-1) and select Edit.

To delete an SOOC, enter a right click on the SOOC entity and select Delete.

Table 49: Create/Edit SOOC Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Enables or disables the Telecom Slave. See "Entity State Descriptions" on p. 430.	**IS**
		Management
Flow ID (Create only)	Flow Identifier to associate with this SOOC.	(drop down list of provisioned Flow IDs)
Slave IP Address (Create only)	Valid IPv4 address. The IP address must be unique across all IP interfaces in the system.	0.0.0.0
Slave Subnet Mask (Create only)	Valid IPv4 subnet mask.	0.0.0.0
Interface Name (Create only)	When an SOOC is created, an IP interface is created with the Interface Name, IP Address and Subnet Mask. The IP address and Interface Name must be unique across all IP interfaces in the system. The interface name is from 1 to 15 alphanumeric characters (no spaces). This entry is mandatory.	**(blank)**
Unicast Message Negotiation (Create only)	Unicast Message Negotiation	Enabled
		Disabled
Unicast Timeout	Unicast timeout is user configurable. The range is 1 to 600 seconds. The default value is 1 second. This is a read-write attribute and will apply to next restart of request unicast transmission signaling messages.	**1 sec** (1-600 seconds)
Unicast Restart Timer	Unicast restart timeout is user configurable. The range is 30 to 1800 seconds. The default value is 60 seconds. This is a read-write attribute and will apply to the next restart of request unicast transmission signaling messages.	**60 sec** (30 to 1800 seconds)
Priority Mode	Defines the Priority Mode. It identifies the lookup criteria for the priority mapping table. This table is used to perform priority based lookup (to determine low and normal latency) and/or to change the priority value.	**None**
		TOS
		DSCP

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Table 49: Create/Edit SOOC Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Priority	Priority Map Index Selection. The following ranges of Indexes are: 0...7 if Priority Mode is set to TOS; 0...63 if Priority Map Mode is set to DSCP.	**0** 0-7 (TOS) 0-63 (DSCP)
Master Clock Type (Create only)	Master Clock Type	**One Step**
Master Delay Mechanism (Create only)	Master Delay Mechanism	**End-to-End**
Master Priority	Master Priority	**0** (0-7)
Master Protocol (Create only)	Master Protocol	**IPv4**
Master Clock IP Address (Create only)	Master Clock IP Address	0.0.0.0
Master Announce Message Rate (Create only)	Master Announce Message Rate	**1 Packet Per 16 Seconds**
		1 Packet Per 8 Seconds
		1 Packet Per 4 Seconds
		1 Packet Per 2 Seconds
		1 Packet Per 1 Second
		2 Packets Per 1 Second
		4 Packets Per 1 Second
		8 Packets Per 1 Second
Master Announce Receipt Timeout	Master Announce Receipt Timeout	**2**-255 (secs)

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Table 49: Create/Edit SOOC Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Master Delay Response Message Rate (Create only)	Master Delay Response Message Rate	**1 Packet Per Second**
		2 Packets Per Second
		4 Packets Per Second
		8 Packets Per Second
		16 Packets Per Second
		32 Packets Per Second
		64 Packets Per Second
		128 Packets Per Second
Master Delay Response Receipt Timeout	Master Delay Response Receipt Timeout	**2**-255 (secs)
Master Sync Message Rate (Create only)	Master Sync Message Rate	**1 Packet Per Second**
		2 Packets Per Second
		4 Packets Per Second
		8 Packets Per Second
		16 Packets Per Second
		32 Packets Per Second
		64 Packets Per Second
		128 Packets Per Second
Master Sync Receipt Timeout	Master Sync Receipt Timeout	**2**-255 (secs)
Master Lease Duration (Create only)	Master Lease Duration	60 - 1000 (secs) **300**

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Create / Edit a PTP Flow Point (PTPFP)

Once a SOOC, Boundary Clock or Master Clock has been created, a PTP Flow Point (PTPFP) may be created by expanding the NTESP100 entity in the Selection Tree, entering a right click on the associated port entity and selecting Create PTPFP. To edit a PTP Flow Point, enter a right click on the PTP Flow Point entity (e.g., ACC PTP FLOW PT-1-1-1-1-1) and select Edit.

To delete a PTPFP, enter a right click on the PTPFP entity and select Delete.

Table 50: Create/Edit PTP Flow Point Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
PTPFP ID (Create only)	Transparent Clock Identifier	**1**-33
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Enables or disables the Transparent Clock. See "Entity State Descriptions" on p. 430.	**IS**
		Management
PTP Flowpoint Type (Create Only)	Defines the Flowpoint as either an OC Slave, OC Master or Monitoring type. • OC Slave is used when configuring a Telecom Slave and monitoring the t3 [slave timestamp (locally)] or t1 [master timestamp (remote)] of this PTP session is desired. • OC Master is used when configuring a Master Clock Interface, have a remote slave, and monitoring the t3 [slave timestamp(remote)] is desired. • Monitoring is used when monitoring a PTP session that works regardless to this SP-100 and the traffic is mirrored to the SP-100 - it can monitor t3 (slave to master) or t1 (master to slave).	**OC Slave**
		OC Master
		Monitoring
Flow ID (Create Only)	Flow Identifier to associate with this Transparent Clock. If no flow has been created, only "None" is populated in the drop-down list.	(drop down list of provisioned Flow IDs)
COS	Class Of Service.	**0**-7
CIR	Committed Information Rate in bps. Minimum setting is 0 bps, maximum setting is Network Port bandwidth.	**0**-1000000000
EIR	Excess Information Rate in bps. Minimum setting is 0 bps, maximum setting is Network Port bandwidth.	**0**-1000000000
Buffer Size	Buffer size in KB. Minimum setting is 0, maximum setting is 15360.	**0**-15360
Untagged Check Box (Create only)	Defines whether the VLAN configuration is untagged or tagged. Selecting this option sets Untagged VLAN configuration.	**Selected**
		Unselected
Outer VLAN Check Box (Create only)	Defines whether the Outer VLAN tag entry is allowed. Only selectable if the Untagged check box is unselected.	Selected
		Unselected

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Table 50: Create/Edit PTP Flow Point Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Outer VLAN Ethertype (Create only)	Defines the Ethertype for the Outer VLAN tag.	**0**
Outer VLAN Tag (Create only)	Defines the VLAN tag and priority that is associated with this PTP Flow Point Outer VLAN Tag.	**1** to 4095
		0 to 7
Inner VLAN1 Check Box (Create only)	Defines whether the Inner VLAN1 tag entry is allowed. Only selectable if the Untagged check box is unselected.	Selected
		Unselected
Inner VLAN1 Ethertype (Create only)	Defines the Ethertype for the Inner VLAN1 tag.	**0**
Inner VLAN1 Tag (Create only)	Defines the VLAN tag and priority that is associated with this PTP Flow Point Inner VLAN1 Tag.	**1** to 4095
		0 to 7
Inner VLAN2 Check Box (Create only)	Defines whether the Inner VLAN2 tag entry is allowed. Only selectable if the Untagged check box is unselected.	Selected
		Unselected
Outer VLAN Ethertype (Create only)	Defines the Ethertype for the Inner VLAN2 tag.	**0**
Outer VLAN Tag (Create only)	Defines the VLAN tag and priority that is associated with this PTP Flow Point Inner VLAN2 Tag.	**1** to 4095
		0 to 7

Create / Edit an Ordinary Clock Slave (OCS) Port

Once a PTPFP has been created, an Ordinary Clock Slave (OCS) Port may be created by expanding the Telecom Slave entity in the Selection Tree, entering a right click on the SOOC entity and selecting Create OCS Port. To edit a OCS Port, enter a right click on the OCS Port entity (OCS PORT-1-1-1-1) and select Edit.

To delete an OCS Port, enter a right click on the OCS Port entity and select Delete.

Table 51: Create/Edit OCS Port Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
PTP Flow Point (Create only)	PTP Flow Point Identifier to associate with this Ordinary Clock Slave Port. The Service Flow associated with Flow Point and SOOC must be the same.	(drop down list of provisioned PTP Flow Point IDs)

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Create / Edit a Boundary Clock

A Boundary Clock may be created by selecting the PTP icon on the Tool Bar or selecting PTP from the Applications menu, expanding the system folder in the Selection Tree, entering a right click on the NE-1 entity and selecting Create Boundary Clock. To edit a Boundary Clock, enter a right click on the Boundary Clock entity (e.g., BOUNDARY CLOCK-1-1) and select Edit.

A Boundary Clock and Master Clock cannot co-exist. Only one or the other may be provisioned and In Service at a time.

To delete a Boundary Clock, enter a right click on the Boundary Clock entity and select Delete.

Table 52: Create/Edit Boundary Clock Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Boundary Clock Index (Create only)	The index number of the Boundary Clock. One Boundary Clock may be created per system.	**1**
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Use Selected Telecom Slave Clock Identity Check Box (Create only)	Select the “Use Selected Telecom Slave Clock Identity Check Box” if its clock identity is to be used.	Selected **Unselected**
Clock Identity (Create only)	Entry of a Clock Identity of the Telecom Slave is permitted if the “Use Selected Telecom Slave Clock Identity Check Box” is not selected. Entry is 16 HEX characters.	(varies)
Administrative State	Enables or disables the Boundary Clock. See “Entity State Descriptions” on p. 430.	**IS** Management
Timing Source (Create only)	Selects the provisioned Telecom Slave timing source.	**None** (drop-down list)
PTP Domain Number (Create only)	This PTP domain number is used in the domain Number field of the PTP header in the PTP packet. This PTP domain number is used when PTP packet is generated by the SOOC.	**0**-127

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Create / Edit a Master Clock

A Master Clock may be created by selecting the PTP icon on the Tool Bar or selecting PTP from the Applications menu, expanding the system folder in the Selection Tree, entering a right click on the NE-1 entity and selecting Create Master Clock. To edit a Master Clock, enter a right click on the Master Clock entity (e.g., MASTER CLOCK-1-1) and select Edit.

A Boundary Clock and Master Clock cannot co-exist. Only one or the other may be provisioned and In Service at a time.

To delete a Master Clock, enter a right click on the Master Clock entity and select Delete.

Table 53: Create/Edit Master Clock Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Master Clock Index (Create only)	The index number of the Boundary Clock. One Master Clock may be created per system.	**1**
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Clock Identity (Create only)	The Master Clock's Clock Identity. Entry is 16 HEX characters.	(varies)
Administrative State	Enables or disables the Boundary Clock. See "Entity State Descriptions" on p. 430.	**IS** Management
PTP Domain Number (Create only)	This PTP domain number is used in the domain Number field of the PTP header in the PTP packet.	**0**-127
Priority 1	Priority 1 (based on IEEE 1588v2).	0-255 **128**
Priority 2	Priority 2 (based on IEEE 1588v2).	0-255 **128**
Timing Clock Eid (Create only)	The timing reference of the Master Clock.	(drop-down list)

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Create / Edit a Master Clock Interface

A Master Clock Interface may be created by selecting the PTP icon on the Tool Bar or selecting PTP from the Applications menu, expanding the system folder and Boundary Clock entities in the Selection Tree, entering a right click on the Boundary Clock entity and selecting Create Master Clock Interface. To edit a Master Clock Interface, enter a right click on the Master Clock Interface entity (e.g., MASTER CLOCK INTERFACE-1-1-1) and select Edit.

To delete a Master Clock Interface, enter a right click on the Master Clock Interface entity and select Delete.

Table 54: Create/Edit Master Clock Interface Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Master Clock Interface Index (Create only)	The index number of the Master Clock Interface. Up to Four Master Clock Interfaces may be created per system.	**1**-4
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Enables or disables the Master Clock Interface. See "Entity State Descriptions" on p. 430.	**IS** Management
IP Protocol (Create only)	IP Protocol.	**IPv4**
Master Clock Interface IP Address (Create only)	Valid IPv4 address. The IP address must be unique across all IP interfaces in the system.	0.0.0.0
Master Clock Interface Subnet Mask (Create only)	Valid IPv4 subnet mask.	0.0.0.0
Interface Name (Create only)	When an Master Clock Interface is created, an IP interface is created with the Interface Name, IP Address and Subnet Mask. The IP address and Interface Name must be unique across all IP interfaces in the system. The interface name is from 1 to 15 alphanumeric characters (no spaces). This entry is mandatory.	**(blank)**
Priority Mode (Create only)	Defines the Priority Mode. It identifies the lookup criteria for the priority mapping table. This table is used to perform priority based lookup (to determine low and normal latency) and/or to change the priority value.	**None** TOS DSCP
Priority (Create only)	Priority Map Index Selection. The following ranges of Indexes are: 0...7 if Priority Mode is set to TOS; 0...63 if Priority Map Mode is set to DSCP.	**0** 0-7 (TOS) 0-63 (DSCP)
Clock Type (Create only)	Selects the Clock Type. Only One Step is applicable in this release.	**One Step**
Delay Mechanism (Create only)	Selects the Delay Mechanism. Only End to End is applicable in this release.	**End to End**

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Table 54: Create/Edit Master Clock Interface Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Max Slaves Supported (Create only)	Maximum Slaves Supported	**1**
Max Static Slaves Supported (Create only)	Maximum Static Slaves Supported	**0**
Max Announce Message Rate (Create only)	Maximum Announce Message Rate	1 Packet Per 16 Seconds
		1 Packet Per 8 Seconds
		1 Packet Per 4 Seconds
		1 Packet Per 2 Seconds
		1 Packet Per 1 Second
Max Sync Message Rate (Create only)	Maximum Sync Message Rate	1 Packet Per Second
		2 Packets Per Second
		4 Packets Per Second
		8 Packets Per Second
		16 Packets Per Second
		32 Packets Per Second
		64 Packets Per Second
		128 Packets Per Second

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Table 54: Create/Edit Master Clock Interface Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Max Delay Response Message Rate (Create only)	Maximum Delay Response Message Rate	1 Packet Per Second
		2 Packets Per Second
		4 Packets Per Second
		8 Packets Per Second
		16 Packets Per Second
		32 Packets Per Second
		64 Packets Per Second
		128 Packets Per Second
Max Lease Duration (Create only)	Maximum Lease Duration	60 - 1000 (secs) **300**

Create / Edit a Master Virtual Port

Once a PTPFP has been created (which occurs when creating a Master Clock Interface), a Master Virtual Port may be created by expanding the Boundary Clock or Master Clock entity in the Selection Tree, entering a right click on the Master Clock Interface entity and selecting Master Virtual Port. To edit a Master Virtual Port, enter a right click on the Master Virtual Port entity (e.g., MASTER VIRTUAL PORT-1-1-1-1) and select Edit.

To delete a Master Virtual Port, enter a right click on the Master Virtual Port entity and select Delete.

Table 55: Create/Edit Master Virtual Port Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
PTP Flow Point (Create only)	PTP Flow Point Identifier to associate with this Master Virtual Port. The Service Flow associated with Flow Point and Master Virtual Port must be the same.	(drop down list of provisioned PTP Flow Point IDs)

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Create / Edit a Static Slave

Once a Master Virtual Port has been created (by creating a Master Clock Interface), a Static Remote Slave may be created by expanding the Boundary Clock and Master Clock Interface entities in the Selection Tree, entering a right click on the Static Slave entity and selecting Create Static Slave. To edit a Static Slave, enter a right click on the Static Slave entity (e.g., STATIC SLAVE-1-1-1-1) and select Edit.

The number of Static Slaves that may be created is dependent on the Max Slaves Supported and Max Static Slaves Supported entries made when creating the Master Clock Interface (up to 4). If the PTP-Extended-Remote-Slave feature is enabled, the number of remote slaves is extended from 4 to up to 16 (or up to 32 if the max rate of each is up to 64) at the maximum PTP message rate.

To delete a Static Slave, enter a right click on the Static Slave entity and select Delete.

Table 56: Create/Edit Static Slave Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Static Remote Slave Index (Create only)	The index number of the Static Remote Slave.	**1**-4 (or **1**-16)
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Enables or disables the Static Remote Slave. See "Entity State Descriptions" on p. 430.	**IS**
		Management
Static Remote Slave IP Address (Create only)	Valid IPv4 address. The IP address must be unique across all IP interfaces in the system.	0.0.0.0
Unicast Message Negotiation (Create only)	Unicast Message Negotiation	**Enabled**
		Disabled
Announce Message Rate (Create only)	Announce Message Rate. (Applicable only if Unicast Message Negotiation is Disabled.) Announce Message Rate cannot be greater than the associated MCI Max Announce Message Rate.	1 Packet Per 16 Seconds
		1 Packet Per 8 Seconds
		1 Packet Per 4 Seconds
		1 Packet Per 2 Seconds
		1 Packet Per 1 Second

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Table 56: Create/Edit Static Slave Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Sync Message Rate (Create only)	Sync Message Rate. (Applicable only if Unicast Message Negotiation is Disabled.) Sync Message Rate cannot be greater than the associated MCI Max Sync Message Rate.	1 Packet Per Second
		2 Packets Per Second
		4 Packets Per Second
		8 Packets Per Second
		16 Packets Per Second
		32 Packets Per Second
		64 Packets Per Second
		128 Packets Per Second
Delay Response Message Rate (Create only)	Delay Response Message Rate. (Applicable only if Unicast Message Negotiation is Disabled.) Delay Response Message Rate cannot be greater than the associated MCI Max Response Message Rate.	1 Packet Per Second
		2 Packets Per Second
		4 Packets Per Second
		8 Packets Per Second
		16 Packets Per Second
		32 Packets Per Second
		64 Packets Per Second
		128 Packets Per Second

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Edit / Delete a Dynamic Slave

To edit a Dynamic Slave, enter a right click on the Dynamic Slave entity (e.g., DYNAMIC SLAVE-1-1-1-1) and select Edit. The number of Dynamic Slaves that may be created is dependent on the Max Slaves Supported entries made when creating the Master Clock Interface (up to 4). If the PTP-Extended-Remote-Slaves feature is enabled, number of remote slaves is extended from 4 to up to 16 (or up to 32 if the max rate of each is up to 64) at the maximum PTP message rate.

To delete a Dynamic Slave, enter a right click on the Dynamic Slave entity and select Delete.

Table 57: Create/Edit Dynamic Slave Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Alias	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 64 printable ASCII characters long.	up to 64 characters **(blank)**
Administrative State	Enables or disables the Static Remote Slave. See "Entity State Descriptions" on p. 430.	**IS** Management

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SyncJack Configuration Options and Rules

The following section describes SyncJack option settings. The options described in this section are performed using the SyncJack application (located on the Tool Bar or selectable via the Application menu) once the license of the PTP feature has been turned on. The PTP License may be enabled by selecting the Maintenance application, expanding the Administration and Software Licensing entities, entering a right click on Feature Management and selecting Edit Feature.

In addition to configuring SyncJack options, TIE-History stats are available in the SyncJack application.

Clock Accuracy Parameters

Create / Edit a Clock Probe

A Clock Probe may be created by selecting the SyncJack icon on the Tool Bar or selecting SyncJack from the Applications menu, expanding System, NE-1 and Clock Accuracy in the Selection Tree, entering a right click on the Clock Probes entity and selecting Create Clock Probe. To edit an existing Clock Probe, enter a right click on the Clock Probe entity (Clock-Probe-1-1) and select Edit.

To delete a Transparent Clock, enter a right click on the Clock Probe entity (Clock-Probe-1-1) and select Delete, then select OK.

Table 58: Create/Edit Clock Probe Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Clock Probe Index (Create only)	Clock Probe Index. Number is automatically indexed, but is user editable.	**1**-32
Name	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 15 printable ASCII characters long.	up to 15 characters **(blank)**
Reference	Defines the reference source for the Clock Probe. References available are presented in a drop-down list.	**Network Port-1-1-1-1**
		Access Port-1-1-1-1
		BITS IN-1-1-1-1
		CLK-1-1-1-1
		CLK-1-1-1-2
		PPS-1-1-1-1
		PPS-1-1-1-2
		GPS-1-1-1-1
		SYNC-1-1-1-1

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Table 58: Create/Edit Clock Probe Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Reference Expected QL	Defines the expected Quality Level of the selected reference for the Clock Probe. Available QL levels are presented in a drop-down list.	**QL-NONE**
		QL-PRC
		QL-SSU-A
		QL-SSU-B
		QL-EEC1
Source	Defines the source of the clock to be measured by the Clock Probe. Sources available are presented in a drop-down list.	**CLK-1-1-1-1**
		CLK-1-1-1-2
		SYNC-1-1-1-1
		BITS IN-1-1-1-1
		TS-1-1
		PPS-1-1-1-1
		PPS-1-1-1-2
		ACCESS PORT-1-1-1-1
		NETWORK PORT-1-1-1-1
		TIME CLOCK-1-1-1-1
Source Type	Selection for measuring frequency or phase.	**Frequency**
		Phase
MTIE Mask	Define the predefined MTIE Mask to use for measurements. Choices are presented in a drop-down list.	G823 E1 Ssu
		G823 E1 Sec
		G823 E1 Traffic
		G823 Pdh
		G824 T1 Sync
		G824 T1 Traffic
		G8261 E1 Case 1
		G8261 T1 Case 1
		G8261 E1 Case 2
		G8261 EEC Opt1
		G8263
		G8263 temp
		G8272 PRTC
		G8261 1
		G8262 EEC Opt1
		G8262 EEC Opt1 temp
		G8262 EEC Opt2
		G8262 EEC Opt1 Tolerance
Mask Margin,%	The margin percentage to be applied to the selected MTIE Mask. Range is from 0 to 100.	**0**

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Table 58: Create/Edit Clock Probe Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Raw Data Collection	Enables or disables Raw Data to be sent to a remote Raw Data Collection server.	Enabled
		Disabled
Measurement Type	Selects the measurement type.	**Frequency**
		Phase

Clock Analysis Parameters

Create / Edit a PTP Clock Probe

A PTP Clock Probe may be created by selecting the SyncJack icon on the Tool Bar or selecting SyncJack from the Applications menu, expanding System, NE-1 and Clock Analysis in the Selection Tree, entering a right click on the PTP Clock Probes entity and selecting Create PTP Clock Probe. To edit an existing PTP Clock Probe, enter a right click on the PTP Clock Probe entity (PTP-Clock-Probe-1-1) and select Edit.

To delete a PTP Clock Probe, enter a right click on the PTP Clock Probe entity (PTP-Clock-Probe-1-1) and select Delete, then select OK.

Table 59: Create/Edit PTP Clock Probe Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
PTP Clock Probe Index (Create only)	PTP Clock Probe Index. Number is automatically indexed, but is user editable.	**1**-32
Name	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 15 printable ASCII characters long.	1 to 15 characters **(blank)**
PTP Flowpoint	Identifies the PTP Flowpoint used by the PTP Clock Probe. A drop-down list of the provisioned flowpoints available for use is provided	(drop-down list of provisioned PTP Flow Points)
IP Version	Defines whether the PTP Clock Probe uses IPv4 or IPv6. For the current release only IPv4 is supported. Selection is from a drop-down list.	**IPv4** (drop-down list)
Master IP Address	Entry for the IP address of the Master Clock. Entry is a valid IPv4 or IPv6 address according to the IP Version entry. For the current release, only IPv4 is supported. If the PTP Flow Point Type is set to OC Slave, then the Master IP Address must be configured the same as the SOOC.	**0.0.0.0**

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Table 59: Create/Edit PTP Clock Probe Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Slave IP Address	Entry for the IP address of the Slave Clock. Entry is a valid IPv4 or IPv6 address according to the IP Version entry. For the current release, only IPv4 is supported. If the PTP Flow Point Type is set to OC Slave, then the Slave IP Address must be configured the same as the SOOC.	**0.0.0.0**
Direction	Direction of PTP Clock Probe operation. • If the Flow Point Type of the associated PTP Flow Point is set to OC Slave, then Slave to Master or Master to Slave may be selected. • If the Flow Point Type of the associated PTP Flow Point is set to OC Master, then only Slave to Master selection is allowed.	**Slave to Master** Master to Slave
Reference	Defines the reference source for the PTP Clock Probe. References available are presented in a drop-down list.	**Network Port-1-1-1-1** Access Port-1-1-1-1 BITS IN-1-1-1-1 CLK-1-1-1-1 CLK-1-1-1-2 PPS-1-1-1-1 PPS-1-1-1-2 GPS-1-1-1-1 SYNC-1-1-1-1
Reference Expected QL	Defines the expected Quality Level of the selected reference for the PTP Clock Probe. Available QL levels are presented in a drop-down list.	**QL-NONE** QL-PRC QL-SSU-A QL-SSU-B QL-EEC1

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Table 59: Create/Edit PTP Clock Probe Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
MTIE Mask	Define the predefined MTIE Mask to use for measurements. Choices are presented in a drop-down list.	G823 E1 Ssu
		G823 E1 Sec
		G823 E1 Traffic
		G823 Pdh
		G824 T1 Sync
		G824 T1 Traffic
		G8261 E1 Case 1
		G8261 T1 Case 1
		G8261 E1 Case 2
		G8261 EEC Opt1
		G8263
		G8263 temp
		G8272 PRTC
		G8261 1
		G8262 EEC Opt1
		G8262 EEC Opt1 temp
		G8262 EEC Opt2
		G8262 EEC Opt1 Tolerance
Mask Margin,%	The margin percentage to be applied to the selected MTIE Mask. Range is from 0 to 100.	**0**
Raw Data Collection	Enables or disables Raw Data to be sent to a remote Raw Data Collection server.	Enabled
		Disabled
Measurement Type	Selects the measurement type.	**Frequency**
		Phase

Telecom Slave

Edit Telecom Slave Analysis Parameters

A Telecom Slave Analysis may be edited by selecting the SyncJack icon on the Tool Bar or selecting SyncJack from the Applications menu, expanding System, NE-1 and Clock Analysis in the Selection Tree, entering a right click on the Telecom Slave entity (TS-1-1) and select Edit Telecom Slave Analysis.

To edit thresholds, enter a right click on the Telecom Slave entity (TS-1-1) and select Edit Thresholds.

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Table 60: Edit Telecom Slave Analysis

Parameter	Description / Applicable Rules	Option Settings / Defaults
Frequency Recovery Target	Drop-down list to select the desired frequency recovery target.	**G823-PDH-Traffic**
		G823-PDH-Sync
		G8261.1-Output-Wander
Phase Recovery Target	Enter the desired phase recovery target. Range is from 1 to 100,000 nanoseconds. Default is 500.	**500**

PTP Network Analysis Parameters

Create / Edit a PTP Network Probe (PTP Probe)

A PTP Network Probe may be created by selecting the SyncJack icon on the Tool Bar or selecting SyncJack from the Applications menu, expanding System, NE-1 and PTP Network Analysis in the Selection Tree, entering a right click on the PTP Network Probes entity and selecting Create PTP Network Probe. To edit an existing PTP Network Probe, enter a right click on the PTP Network Probe entity (PTP-Network-Probe-1-1) and select Edit.

To delete a PTP Network Probe, enter a right click on the PTP Network Probe entity (PTP-Network-Probe-1-1) and select Delete, then select OK.

Table 61: Create/Edit PTP Clock Probe Parameter Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
PTP Probe Index (Create only)	PTP Probe Index. Number is automatically indexed, but is user editable.	**1**-32
Name	A text and/or number string the user enters to uniquely identify this entity. This string can be up to 15 printable ASCII characters long.	1 to 15 characters **(blank)**
PTP Flowpoint	Identifies the PTP Flowpoint used by the PTP Clock Probe. A drop-down list of the provisioned flowpoints available for use is provided	(drop-down list of provisioned PTP Flowpoints)
IP Version	Defines whether the PTP Clock Probe uses IPv4 or IPv6. For the current release only IPv4 is supported. Selection is from a drop-down list.	**IPv4** (drop-down list)
Master IP Address	Entry for the IP address of the Master Clock. Entry is a valid IPv4 or IPv6 address according to the IP Version entry. For the current release, only IPv4 is supported.	**0.0.0.0**
Slave IP Address	Entry for the IP address of the Slave Clock. Entry is a valid IPv4 or IPv6 address according to the IP Version entry. For the current release, only IPv4 is supported.	**0.0.0.0**

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Table 61: Create/Edit PTP Clock Probe Parameter Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Reference	Defines the reference source for the PTP Clock Probe. References available are presented in a drop-down list.	**Network Port-1-1-1-1**
		Access Port-1-1-1-1
		BITS IN-1-1-1-1
		CLK-1-1-1-1
		CLK-1-1-1-2
		PPS-1-1-1-1
		PPS-1-1-1-2
		GPS-1-1-1-1
		SYNC-1-1-1-1
		TS-1-1
Reference Expected QL	Defines the expected Quality Level of the selected reference for the PTP Network Probe. Available QL levels are presented in a drop-down list.	**QL-NONE**
		QL-PRC
		QL-SSU-A
		QL-SSU-B
		QL-EEC1
RPDV fw Low (ns)	Residual Packet Delay Variation (RPDV), forward, low (in nanoseconds).	1 - 4294967295 **200**
RPDV fw Medium (ns)	Residual Packet Delay Variation, forward, medium (in nanoseconds). Must be higher than the RPDV fw Low setting and lower than the RPDV fw High setting.	1 - 4294967295 **500**
RPDV fw High (ns)	Residual Packet Delay Variation, forward, high (in nanoseconds).	1 - 4294967295 **2000**
RPDV rev Low (ns)	Residual Packet Delay Variation, reverse, low (in nanoseconds).	1 - 4294967295 **200**
RPDV rev Medium (ns)	Residual Packet Delay Variation, reverse, medium (in nanoseconds). Must be higher than the RPDV rev Low setting and lower than the RPDV rev High setting.	1 - 4294967295 **500**
RPDV rev High (ns)	Residual Packet Delay Variation, reverse, high (in nanoseconds).	1 - 4294967295 **2000**
FPP Cluster Range - Assured (ns)	Packet Delay Variation Assured (in nanoseconds)	1 - 4294967295 **25000**
FPP Cluster Range - Satisfied (ns)	Packet Delay Variation Satisfied (in nanoseconds)	1 - 4294967295 **150000**

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Scheduled SyncJack Activity Settings

The following section describes scheduled SyncJack activities option settings. A scheduled SyncJack is invoked by selecting the SyncJack icon on the Tool Bar or selecting SyncJack from the Applications menu, expanding the system folder in the Selection Tree, entering a right click on SyncJack Schedules and selecting Create Schedule. Default settings are identified in bold. Up to 10 SyncJack Schedules may be created.

Table 62: SyncJack Schedule Configuration Settings

Parameter	Description / Applicable Rules	Option Settings / Defaults
Identification		
Schedule Index (Create Schedule only)	An Identifier value used to uniquely identify this SyncJack Schedule.	1-255
Activity ID	Activity identifier (1 to 15 ASCII characters). This is a user specified unique identifier associated with a Probe, and is not a mandatory entry.	up to 15 characters **(blank)**
Schedule Parameters		
Schedule Type	Define schedule type as a one time or periodic execution. The current release only supports One Shot scheduling.	**One Shot**
Start Time Buttons	Activate either an immediate SyncJack or future (scheduled) SyncJack.	**Now** Future
Periodic Interval (secs) (future)	Specifies the interval between subsequent runs (in seconds). This option is only available if Schedule Type of Periodic is selected. This option is not available in the current release.	Range 1 to 2147483647
Duration Buttons	Define the duration as continuous or a fixed time (in seconds). Only applicable if Schedule Type of One Shot is selected.	**Forever** Fixed
Duration (secs) Entry Window	Define the duration in seconds. Valid entries are 0 (continuous) through 9999 (seconds) if Schedule Type of One Shot is selected, and valid entries are 60 through 9999 (seconds) if Schedule Type of Periodic is selected. This option is only valid if Fixed duration is selected.	0 to 9999 (One Shot) 60 to 9999 (Periodic)

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Table 62: SyncJack Schedule Configuration Settings (Continued)

Parameter	Description / Applicable Rules	Option Settings / Defaults
Start Time Entry Windows	The date in format: yyyy-mm-dd and the time. When cursor is placed in data entry window and mouse click is entered, a calendar selection appears, allowing date selection. Entry selection must be the current date or greater. This option is only applicable if Future start time is selected.	yyyy-mm-dd
	Define the duration in hours, minutes and seconds in format: hh:mm:ss (24-hour clock time entry). When cursor is placed in data entry window and mouse click is entered, a start time drop down selectable menu appears, in 15 minute segments. Entry selection must be greater than the current time. This option is only applicable if Future start time is selected.	hh:mm:ss
Schedule SJ Test Items	Selects the Probes that belong to this SyncJack schedule. To add a Probe, select a Probe from the Schedule Probes list. Multiple Probes may be selected. Probes may be deselected by clicking on the Probe once again before hitting the OK button. Only previously created Probes that are not used for another Scheduled Activity are available for selection. Once a schedule has been created, it cannot be edited. It must be deleted and re-created with the desired new parameters.	Any available probes will be displayed in the Schedule SJ test Items list as a checkbox selection

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Result Analysis

Configure MTIE Comparison Parameters

Result Analysis may be configured by selecting the SyncJack icon on the Tool Bar or selecting SyncJack from the Applications menu, expanding System, NE-1 and Result Analysis in the Selection Tree, entering a right click on the MTIE Comparison entity and selecting Configure.

Table 63: Configure MTIE Comparison Analysis

Parameter	Description / Applicable Rules	Option Settings / Defaults
MTIE Mask	Define the predefined MTIE Mask to use for measurements. Choices are presented in a drop-down list.	G823 E1 Ssu
		G823 E1 Sec
		G823 E1 Traffic
		G823 Pdh
		G824 T1 Sync
		G824 T1 Traffic
		G8261 E1 Case 1
		G8261 T1 Case 1
		G8261 E1 Case 2
		G8261 EEC Opt1
		G8263
		G8263 temp
		G8272 PRTC
		G8261 1
		G8262 EEC Opt1
		G8262 EEC Opt1 temp
		G8262 EEC Opt2
		G8262 EEC Opt1 Tolerance
Test Result Entity Checkbox	Selects the Probes that have been previously scheduled. To add a Probe, select a Probe from the Test Result Entity list. Multiple Probes (up to 4) may be selected.	Any available probes will be displayed in the Test Result list as a checkbox selection

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Edit Raw Data Collection Parameters

Raw Data Collection may be edited by selecting the SyncJack icon on the Tool Bar or selecting SyncJack from the Applications menu, expanding System and NE-1 in the Selection Tree, entering a right click on the Raw Data Collection entity and selecting Edit Raw Data Server.

Table 64: Edit Telecom Slave Analysis

Parameter	Description / Applicable Rules	Option Settings / Defaults
File Transfer Method	Drop-down list to select the desired File Transfer Method. The desired protocol must be enabled at the System level (see "System Configuration Options and Rules" on p. 445).	**FTP**
		SCP
		SFTP
Server IP	The IP Address of the Raw Data Server.	**0.0.0.0**
User ID	The User ID of the Raw Data Server.	**(empty)**
User Password	The User Password of the Raw Data Server.	**(empty)**

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